STEEL
The Weekly Magazine of Metalworking

VOL. 128 NO. 22 MAY 28, 1951

THIS WEEK IN METALWORKING

NEWS

PRODUCTION-ENGINEERING

MARKETS

Editorial and Business Staff—Page 10. Advertising Index—Page 146. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week **...Will the Merchant Iron Supply Be Adequate?... Metal Spinning Now a Production Tool... Choose the Right Nickel Plating System... How To Drill Cast Iron with Carbide Tipped Twist Drills**

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Behind the Scenes...

Sweet Problem

The problems of trade association executives are legion, but we'll bet that few of the officials have ever faced the dilemma now before Walter S. Doxsey, president of American Steel Warehouse Association. He must decide whether to eat several thousand pieces of candy, or return it all, with considerable embarrassment, to the generous donor.

When his group held its annual convention at the Drake in Chicago, Maitre D'Hotel Eric Dahlberg presented him with the association seal made in colored candy. The seal, 24 x 30 inches, was framed in a glass cover. Fancy work in candy around the edges was like molding on a picture. The seal arrived in Walter's Cleveland office a while ago, elaborately packed. But unfortunately, the candy in the seal was not well secured. Glue had given away, and the seal was in a thousand pieces.

Pickles, Bow Ties and Daddy

You'll be relieved to discover that you have just passed National Pickle Week. It was from May 18 to May 27. But you still have time to prepare for National Bow Tie Week, June 10-17, and Expectant Father's Day, June 16. Father's Day, of course, is June 17. We can hardly wait for the last seven days in March, 1952, which will be Honey For Breakfast Week.

You'll note that the perspicacious pickle people stretched their week out to nine days to work in two week ends. We deduct from that move that most pickles are eaten on week ends. We're getting out all our old bow ties for the June event, although we're sadly out of practice in tieing the things. We're making no preparations whatever for Expectant Father's Day.

Aluminums Meeting

We would not repeat the following if just anybody had reported it, but that reliable publication, *The Milwaukee Journal,* vouches for its authenticity.

That newspaper reports that one Frank Mueller was making a business call on a Milwaukee firm. He was admitted to the reception office on the first floor and while waiting for his appointment to be confirmed, asked the guard on duty if there were any magazines about that he could read.

The guard looked around and turned up with a periodical in his hand. "Here's something about aluminum, if you want to read it," the guard said. Glancing at the cover, Mr. Mueller noticed that it was *The Alumnus,* a quarterly published by the Iowa State Teachers College.

Well Traveled

At least one copy of STEEL travels 7000 to 8000 miles to reach its destination and then journeys many hundreds of miles more while its readers peruse it. Jay DeEulis, former engineering editor of STEEL and recalled into the Navy, gets the copy which is also in great demand among the other officers of the U.S.S. ELDORADO. The ship on which Jay is serving is in Asiatic waters.

Lakefaring Bible

Now off the press is one of the more important but less frequently issued of the Penton publications. The Great Lakes Red Book has been for years the bible of lakefaring men. It is a directory of over 1500 vessels plying the Great Lakes. The 1951 edition puts in the palm of your hand (the book measures 3 1/16 by 4¾ inches) a list of the owners, captains and engineers of those ships and gives all other data of importance to the marine trade.

Although we can get violently seasick in a rowboat on Lake Erie, we still enjoy the romance of the Lakes via the Red Book, revelling in ship names like the General Orlando M. Poe, David Z. Norton, Samuel F. B. Morse and Hilda (a barge, poor girl).

Puzzle Corner

The farm problem of May 14 evolved into a puzzle in trigonometry. Each of the children get a circular farm of 82.4 acres. The father retains 140.2 acres. First in with the correct answers were M. S. Bailey of Machine Products Corp., A. W. Everest of General Electric Co., John L. Vaupel of Central Iron & Steel Co. and Joseph J. Santoleri of Lukens Steel Co.

Suppose you place a quarter on the table and hold it fixed and then revolved another quarter around it. How many revolutions does the second quarter make in completely encircling the first quarter once?

Shrdlu

(Metalworking Outlook—Page 39)

The Metalworking Outlook

CMP Schedules Flexible

CMP officials have not decided and do not propose to decide until some time in June what the coverage of CMP will be for the third quarter. Despite rumors to the effect, consumers durable goods will not go under CMP for the third quarter. The only programs definitely blocked out thus far for CMP in the third and fourth quarters are some military and related projects. CMP officials claim that, if they have to, they are equipped to slide into a 100 per cent control program by the end of the fourth quarter.

Still No Renegotiation Board

President Truman signed the new renegotiation act Mar. 23, but the new board has not yet been appointed and not one regulation has been written. For the past two months, industry has had to play by ear and fears that it will discover it has been way out of tune by the time Washington writes down the notes. Metalworking men have been generally following the regulations and interpretations in the old 1948 act. Even if a complete new renegotiation board is appointed tomorrow, some time will elapse before the group can publish regulations concerning the present legislation.

Wage Spiral Starts

The old wage stabilization formula is out the window now that the new wage board has approved the meat packer and other pay increases. The debate now is: Come out with an entirely new wage formula? Or, drift by catch-as-catch-can and approve or disapprove pay boosts as they come along? One pay boost certain to be approved is a 3-cent-an-hour cost-of-living allowance for some 800,000 auto workers, granted last week because the BLS index for Apr. 15 rose to 184.5, compared with 181.6 for Jan. 15.

More Price Rules Coming

New ferrous and nonferrous scrap pricing regulations will be ready soon. Only some of the final details are yet to be worked out. A price regulation on steel warehouses is also in the works, as is one on castings. All those prices were not covered in either CPR 22 or 30 (p. 47), but were under the general regulation of last January. New pricing orders will eventually cover practically all metalworking products.

Draft Exemptions for Apprentices?

Watch for increasing pressure by trade groups to get draft exemptions for job apprentices similar to those offered to college students. National Tool & Die Manufacturers Association is campaigning for a scheme that would recognize the importance of training in the tool and die field. Machine tool builders and other manufacturers having particularly pressing manpower problems may follow suit. Training of tool and die workers takes 3½ years or about 8000 hours of plant instruction.

Defense Act Changes Studied

President Truman will get some—but far from all—the broad powers he wants under an extension of the Defense Production Act. The

Production-Engineering News—p. 75 *The Market Outlook—p. 117*

Senate Banking Committee is studying the measure, and says it needs more time. The current act, due to expire June 30, may be extended in practically its present form for a short period to allow the committee to look the new proposal over more carefully. In his amendments, President Truman wants power to condemn property, license business and set up production councils.

Productivity: It Dropped

Industrial output per manhour increased only 1 per cent in 1950, compared with a 3 per cent average annual boost over the past 30 years. Although alarming, that decline is partly explained by the industrial recession in 1949 when capital expenditures dropped somewhat. The 1949 cutbacks affected 1950 modernizations, a major factor in boosting productivity improvements. Expect a 3 per cent increase or higher for 1951 because 1950 capital expenditures were heavy. A partial measure of productivity is in the gross national product. In the first 1951 quarter GNP was at an annual rate of $314 billion, $14 billion higher than in the preceding quarter.

Progress on Federal Catalog

A federal catalog of all items that the government purchases is well under way. The idea is to systematize and unify federal procurement. The aim is to have one item called by one name, one number and one description by all government buyers. In another ten months the preliminary identification phase will be completed. The catalog will have about 2.5 million cards—for 2.5 million items—when the job is finished.

Straws in the Wind

Chevrolet General Manager T. H. Keating is campaigning for better treatment by government of the machine tool industry; he's the first major executive, aside from machine tool builders, to tackle the issue . . . Pressure is mounting to have the government set up a small business office as a separate and claimant agency . . . NPA is extending priority assistance for construction of 250 railroad locomotives in the third quarter . . . As of May 7, 1235 certificates of necessity for fast tax write-offs had been issued; the amount permitted for rapid amortization is $3,833,200,000.

Here and There in Industry

Companies are troubled by the paperwork, unrealistic attitude on administrative expenses and turgid language in the new pricing regulations 22 and 30 (p. 47) . . . Speakers at the American Iron & Steel Institute predict easing in steel supplies before the end of the year (p. 49) . . . Defense Mobilizer C. E. Wilson says we can expect a civilian economy comparable with pre-Korean levels by the end of 1953 (p. 51) . . . About $1.2 billion worth of materials handling equipment was shipped in 1950, but the 1951 outlook is clouded by materials shortages and government controls (p. 53) . . . NPA believes the steelworks expansion is attainable, but it is concerned about raw materials to feed the added capacity (p. 57).

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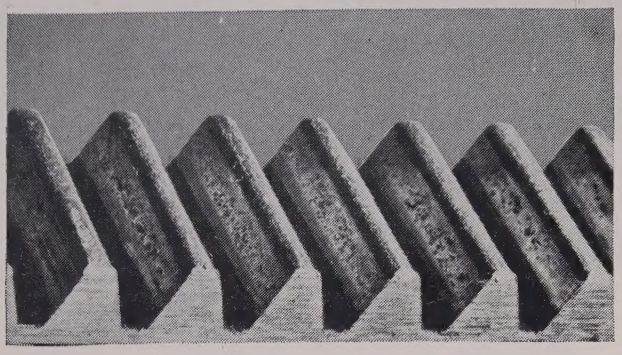
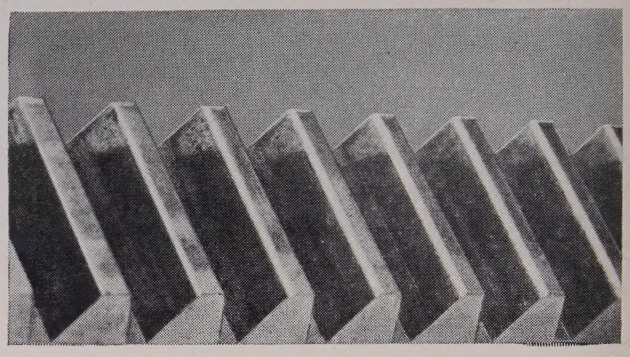


This forged steel gear rack shows severe wear and pitting. The rack was made from free-machining, medium carbon, resulfurized manganese steel, corresponding in composition approximately to the A.I.S.I. C-1137 type. It was used as-forged, with a hardness of 200 Brinell, to operate against a gear made from sintered high carbon steel, copper-impregnated, with a tensile strength of 85,000 p.s.i.



This ductile iron rack, produced by The Acme Shear Company, Bridgeport 1, Conn., showed no pitting . . . after exactly the same service test as the steel rack. The only evidence of wear is a burnished appearance on edges of the teeth. This ductile iron rack had a hardness of 205 Brinell, but any hardness within the range of 150/200 proves satisfactory under similar conditions. Saving in cost is estimated at 60%, based on the low initial cost of ductile iron, and its superior machinability.

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Productivity

Members attending the annual meeting of the American Iron and Steel Institute last week sensed an atmosphere reminiscent of World Wars I and II. There was a dominant note of earnest desire to meet a challenge—a determination that whatever lies ahead, the steel industry wants to do more than any reasonable person has a right to expect of it.

Zeal of this order is not new. It was present in 1917 and in 1941. However, the steelmakers' zeal in 1951 to exceed expectations is engulfed in conditions radically different from those encountered during the earlier emergencies.

For instance, in World Wars I and II the industry buckled down to its war task confident that when victory was achieved, it could return to peacetime pursuits. There was a definite terminal point. Today the emergency is one in which the objectives are cloudy and the end indefinite. It is infinitely harder to meet a fuzzy challenge than to combat a clear-cut one.

Secondly, the current expansion program of the industry dwarfs anything attempted previously. It is staggering. Speakers at last week's meeting performed a valuable service in emphasizing the tremendous responsibilities the industry has assumed in increasing steel ingot capacity to 118 million tons annually by the end of 1952.

Third is the cost of new facilities. Charles M. White of Republic Steel told steelmakers that at the beginning of 1946 they had invested $5.8 billion in properties having a capacity of 92 million tons annually. By the end of 1952 the industry will have spent $5 billion for the 26 million tons of capacity added since the beginning of 1946. Here roughly is an investment of $63 per annual ton before VJ Day and of $192 per ton thereafter.

These startling figures, coupled with facts presented by Walter Tower, Elton Hoyt II and other speakers, point quite clearly to the major job that lies ahead for the American steel industry. It is productivity. Somehow, management must continue and accelerate its remarkable program of technological progress. It must explore every possibility of improving the co-operation of employees. Productivity is the new order of the day.

E. L. Shaner

EDITOR-IN-CHIEF

COMPLICATED RULINGS: Thousands of metalworking executives are sweating over the Manufacturers' General Ceiling Price Regulation 22, and Machinery Makers' price regulation, CPR 30. These were scheduled to go into effect May 28 but many manufacturers petitioned the Office of Price Stabilization for an extension and the date was set back to July 2.

Requests for postponement arise because of the time required for executing the voluminous paper work involved. Representatives of many

companies feel that CPR 22 and 30 are unrealistic as to administrative expenses. Others complain that the regulations are not clear. Even though the deadline has been set back, it will be a long time before many of the moot questions in the regulations are clarified by interpretations that will stick.

Some industry-spokesmen think the general price ceiling set last January is adequate. Their argument will gain strength if CPR 22 and 30 prove to be too complicated for practical application. —p. 47

* * *

DIESELIZATION SCRAP: Thus far in 1951, Class I railroads have been placing new locomotives in service at a rate far exceeding that of 1950. A large proportion of the new motive power is diesel-driven. For instance, of the 1755 new locomotives on order May 1, 1733 were diesels, 18 steam and four electric.

This preponderance of diesels has been going on for several years and it obviously means that old steam locomotives have been taken out of service at an unprecedented rate. In view of the urgent need for scrap, one wonders whether the railroads have been scrapping their abandoned steam units as rapidly as circumstances warrant. In fact, a thorough study of what dieselization has done to railroad back shop, roundhouse and storehouse facilities and inventories might yield clues to overlooked sources of scrap. —p. 51

* * *

METALLICS IN 1953: Most talk about steel expansion assumes that ingot capacity will be about 118 million tons by the end of 1952. National Production Authority, in its studies, assumes that capacities as of July 1, 1953, will be 118 million tons of ingots, 3.5 million tons of steel castings, 17 million of gray iron castings and 1.6 million of malleable castings.

These total 121.5 million tons for steel and 18.6 million tons for cast iron. About 150.7 million tons of pig iron and scrap will be needed annually to feed these facilities. Estimated scrap supplies and pig iron output from existing and projected blast furnaces account for 147.4 million tons by July 1, 1953. NPA is concerned about the apparent deficit of 3.3 million tons.

There may be tight squeezes at times but it is a fair bet that the materials will be available. Remember that expansion is financed privately. Unlike public financing, private money usually looks before it leaps. —p. 57

* * *

TWENTY MILES A DAY: New line pipe fabricating plant of Basalt Rock Co. at Napa, Calif., demonstrates what can be done when sound engineering is applied to the integration of material handling, forming, welding, shearing and machining equipment.

The plant consists of two fabricating lines, one for 8⅝ to 20-inch diameter pipe and the other for pipe ranging from 22 to 36 inches in diameter. Sequence of major operations is cutting plates to exact circumferential size on rotary shear, preforming outer edges to the radius of the finished pipe, forming plate into a U shape in hydraulic press, closing the U-shaped plate into cylindrical shape in a rounding press, automatically welding the longitudinal seam, shrinking or expanding the pipe to increase its tensile strength, facing and beveling the ends, pressure testing and inspection.

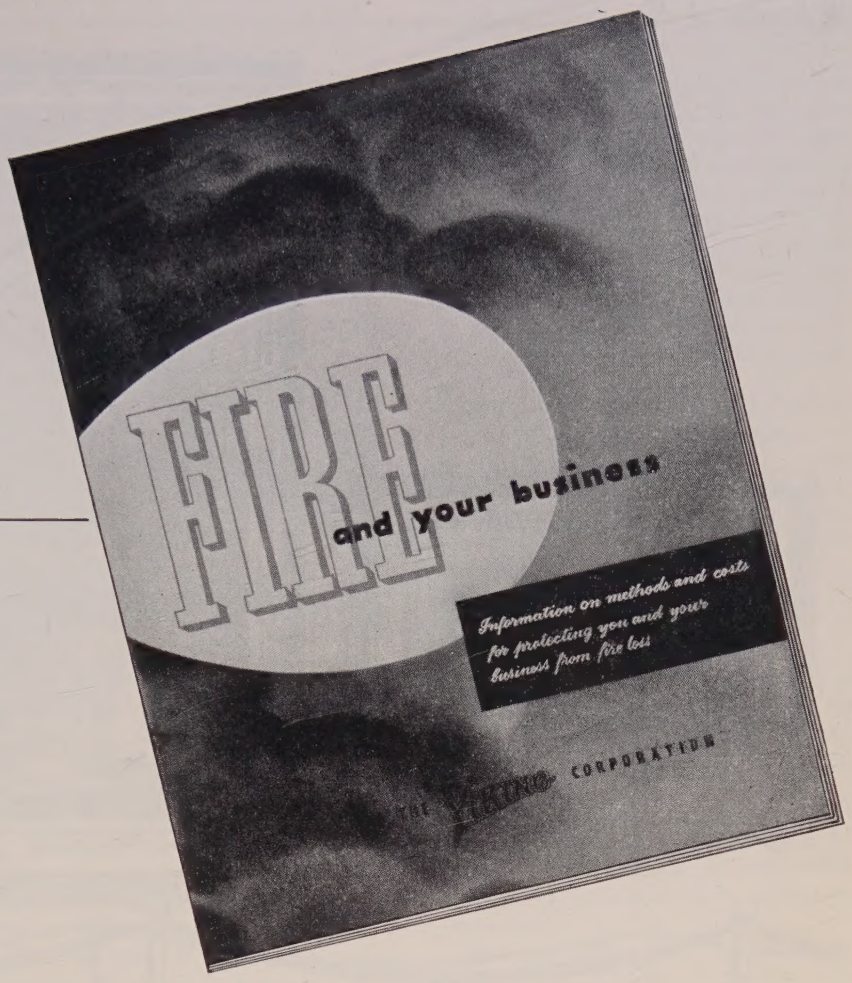
These operations have been streamlined so effectively that the plant can convert about 1000 tons of plate into 20 miles or more of 20 to 36-inch steel line pipe daily. —p. 78

* * *

RECRUITING, TRAINING: If your plant is in an area where substantial industrial expansion is in progress or where a prime contractor is recruiting workers for a defense contract, you know that the problem of holding old employees and attracting new ones is acute. In addition to local competition you may be confronted by efforts of companies several hundred miles away which send agents into your area to lure your employees away.

This competition applies to many skills in the metalworking industries but there is one category in which wartime activity always develops scarcities—trained welders. You can upgrade the more alert of unskilled workers on your payroll or bring in people from high schools, vocational schools and other sources. In any event, the success of your efforts will depend in large measure upon the soundness of your recruiting and training methods. Study procedures that have been proved by experience and adapt them to your own situation. —p. 82

this book can help you answer an important question



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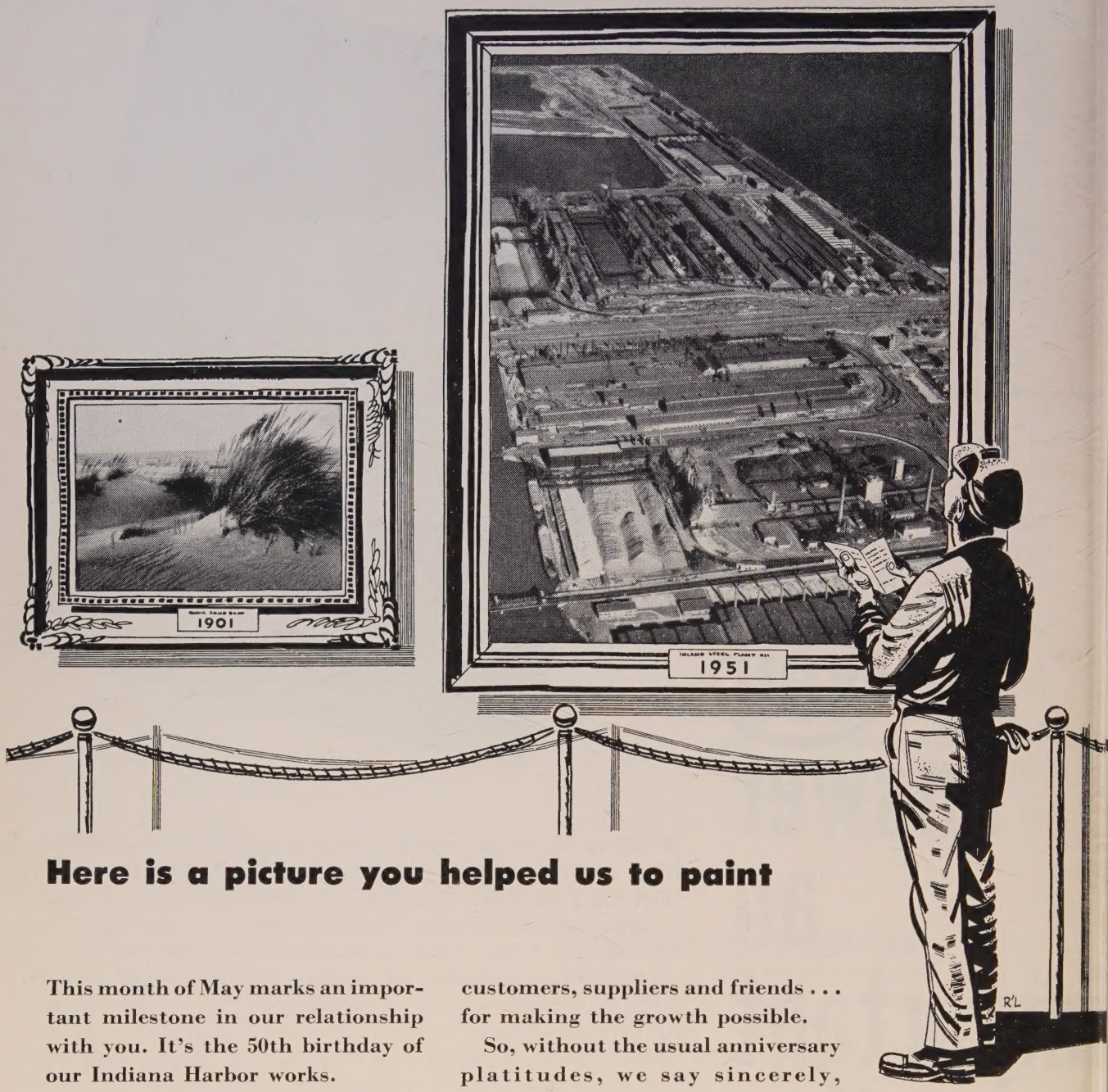

Here is a picture you helped us to paint

This month of May marks an important milestone in our relationship with you. It's the 50th birthday of our Indiana Harbor works.

Naturally we're a little proud of the growth of "The Harbor" from a sandy wasteland to an efficient steel-making facility. But, more than that, we're grateful to you . . . our customers, suppliers and friends . . . for making the growth possible.

So, without the usual anniversary platitudes, we say sincerely, "Thanks."

(By the way . . . the picture on the right is rapidly becoming obsolete as we further expand our ingot producing facilities by another 20%).

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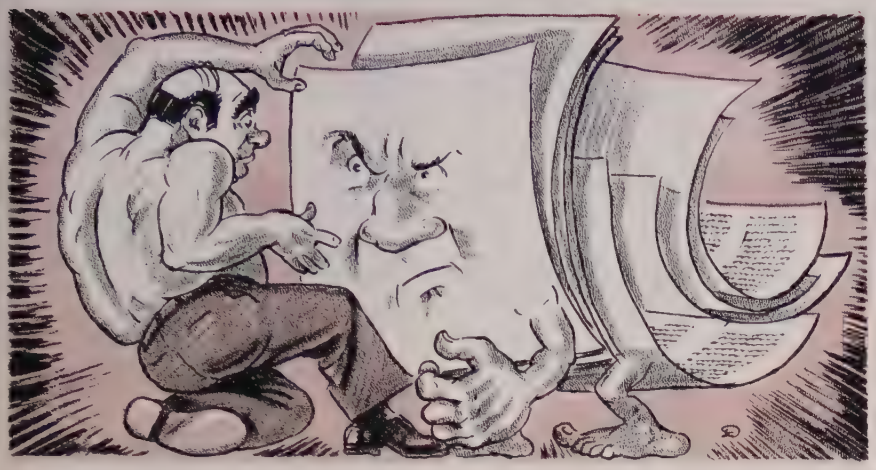


Industry Wrestles with Price Rules

Metalworking is troubled by paperwork, unrealistic attitude on administrative expenses and turgid language in new price regulations 22 and 30

UNREALISTIC on administrative expenses . . . not clearly written . . . too much paperwork. Those were the major criticisms on the new pricing regulations as industry burned the midnight oil last week to file data on the general manufacturers' order, Ceiling Price Regulation 22, and the machinery makers' CPR 30.

The orders were to have gone into effect May 28, but the deadline has been moved to July 2 because many companies couldn't get the voluminous paperwork done in time. If some firms have already filed, they have the option of using their new ceilings on May 28. But no price increases may be put into effect until 15 days after filing with OPS.

Not the Question—None of the companies queried by STEEL denies that we need price controls. Many think that the general price ceiling set last January is adequate. They point out that the wholesale price index is now at 182.2, the lowest since the end of January. As of late last week, few companies had dug deep enough into the mass of information required to arrive at CPR 22 or 30 ceilings to determine precisely how the orders would affect them. But one company official said: "The way it looks now, CPR 22 will let us break even—just barely."

The universal complaint is that both CPR 22 and 30 are unrealistic on administrative expenses. One company that comes under CPR 30 figures that its total costs have increased 100 per cent in the past year. Scarcely more than half that can be figured into the firm's new ceiling. The rest is higher overhead, including overtime which can't enter into ceiling calculations and the cost of hiring more clerks to help with the CPR 30 paperwork.

Clear as Mud—Most companies also complain about the lack of clarity in both regulations. In Detroit last week several business associations joined to sponsor a last-minute conference designed to clear up troublesome points. Some small firms have had to hire outside legal counsel to advise on the regulations. OPS district and Washington offices have been deluged with requests for interpretations.

In the greatest turmoil about the price orders are the large companies. They often have some products that come under CPR 22 and others affected by CPR 30. Insulated wire, for example, comes under 30; partially fabricated under 22. There are still cases where it's hard to tell which ruling applies, but CPR 30 appears to be the one which is most applicable to metalworking.

There are also many instances of companies with new products—either defense or civilian—that were underpriced during the base period because at that time the company had not had enough experience with them to price correctly.

Silver Lining—The companies contacted by STEEL found some good in the new regulations. They found that the base periods set up were "practical" for the most part. They thought the scheme to give the manufacturer his choice of several methods to compute his ceiling had "much merit." They felt that the products affected by CPR 22 and 30 were shrewdly picked by OPS as items that could not easily be black marketed. They welcomed the provision that will permit them to appeal hardship cases. Although the regulations promise action on such appeals within 30 days, most companies doubted that they would get judgments that rapidly.

The reaction by industry to CPR 22 and 30 is generally one of painful irritation, but not desperation. The only companies that approach desperation are those that, in the base period, were caught with their prices down.

Changes in CPR 30 Sought

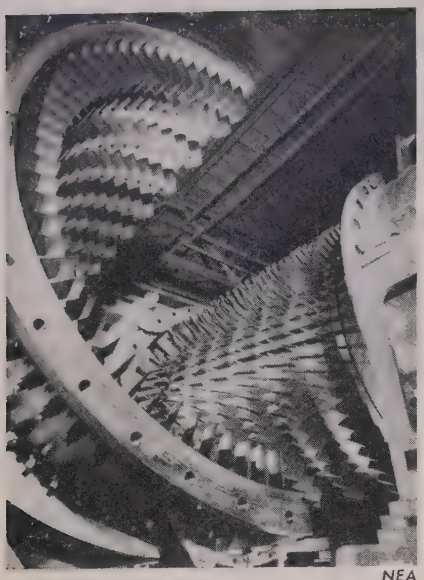
A move to prevail on the Office of Price Stabilization to modify CPR 30 is under way by the National Production Authority and the Department of Defense. Whether OPS will accede remains to be seen. Unless the order is revised its effect is sure to be discouraging to maximum production of machine tools and allied production equipment.

Two provisions are sought. One would allow prices to be increased to include higher costs due to overtime payments and multishift premiums. The other would permit naming higher prices when machines are built under subcontract, so as to include the abnormal expense incidental to furnishing blueprints, templates, jigs and fixtures, patterns and a diversity of engineering services. Under the provision that is sought, for example, a machine that comes to $20,000 when made by the regular manufacturer, might come to $25,000 when made by a subcontractor. The same provision is asked for components made by subcontractors. Without such flexibility, say informed officials, it will be difficult to get the armament equipment program out of the slow-motion stage.

No Price Aid in Conversion Steel

Many parts manufacturers who are consuming more "conversion" steel than during their base periods have gained an erroneous impression that by causing their customers to buy the steel which they fabricate they can escape the necessity of absorbing extra costs under Ceiling Price Regulation 30 (on machinery and related manufactured goods).

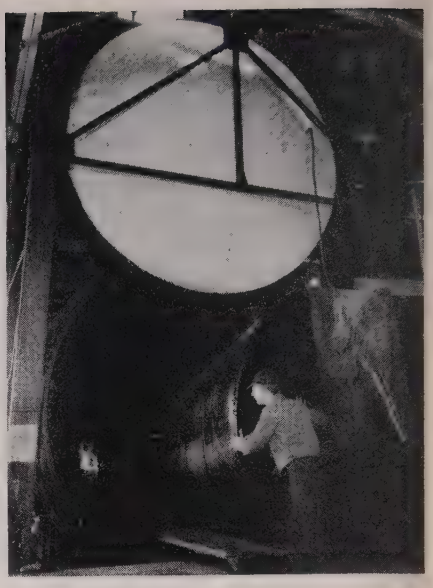
Such procedure, Office of Price



NEA

BREEZEMAKER: Air is pushed through a 4 x 4-foot supersonic pressure wind tunnel at a rate of 860,000 cubic feet per minute by this seven-stage axial flow compressor. It is being used for flight research at NACA's Langley Aeronautical Laboratory in Hampton, Va. The 55-ton rotor spins at 1300 revolutions per minute, and is so delicately balanced that it can be turned ← with one finger

HOT HOUSE: Huge fuel cell for a B-47 Stratojet bomber is placed in a 15 x 48 foot vulcanizer at the Ft. Wayne plant of United States Rubber Co. The vulcanizer weighs 78 tons and has a 34-foot high door. One cure requires about 9000 gallons of water →



Stabilization spokesmen tell STEEL, is in violation of Section 49 b2 of the regulation which states that "requiring a customer to furnish material for processing not in accordance with previous practice" is an evasion subject to treble damages and criminal penalties.

Under the regulation, the consumer is permitted to include in his costs the increase in the above-market premium he pays for the same amount of steel tonnage he bought during the base period. That is, he must absorb the increased cost on the conversion or other tonnage he buys in excess of the tonnage he bought in the base period. This is the rule when the parts manufacturer buys the steel, when the customer buys the steel and has the parts manufacturer perform work on it, and when the customer buys the steel and manufactures it into parts in his own plant.

OPS uses the same definition for conversion steel as in NPA Order M-47, Sect. 2(d): "Conversion steel means steel mill products which have been obtained by the consumer in consequence of the consumer or some other person having furnished, directly or indirectly, to one or more steel producers or converters, steel mill products in a less finished form such as, but not limited to, ingots, blooms, billets, slabs, rods, skelp, and hot-rolled sheets in coils, for the express purpose of procuring such steel mill products."

Interim Price Arrangements Set

Interim pricing arrangements for some industries have been made.

Toy manufacturers will price under CPR 22 until a tailored regulation is prepared for their industry. Automotive original equipment parts manufacturers will price under CPR 30 for a while. The parts manufacturers prefer a specific regulation similar to the old MPR 425 under OPA.

A Break for Small Producers

The Office of Price Stabilization gave small business another break.

Machinery manufacturers with gross sales below $250,000 a year now can stay under the General Ceiling Price Regulation (the general freeze) of Jan. 26 if they so elect.

Until the OPS issued Amendment 2 May 23 to Ceiling Price Regulation 30 they were required to remain under CPR 30, the machinery manufacturers price order. This amendment gives machinery makers the same option provided to small businesses in the general manufacturers price order, CPR 22.

It was initially felt, OPS said, that the nature of the industries covered by CPR 30 made this optional pricing arrangement unnecessary, but experience already has demonstrated that many small concerns lack the records needed to make the calculations called for by the new regulation.

Quality Control Men Meet

We are running at little better than half power in three factors basic to maximum industrial production—machines and tools, methods and control and man-effort.

So said Fred C. Crawford, president of Thompson Products Inc., Cleveland, in speaking before the fifth national convention of the American Society for Quality Control in Cleveland last week. Mr. Crawford charges that half of the nation's machines and tools are obsolete. He says only half of management—supposed to be the smartest in the world—is aware of the benefits of statistical quality control in improving methods and control. The worker himself, partly because of the other two limitations, operates at only about 60 per cent efficiency.

The convention also featured a show at which some 40 exhibitors displayed quality control instruments or demonstrated how they apply quality control in their plants.

Stainless Set-Asides Up Sharply

There won't be much "free" stainless steel during the third quarter.

Set-asides of stainless that period for filling defense-rated orders were increased sharply by the National Production Authority. In some instances the entire output of stainless steels must be reserved for rated orders.

Third quarter set-asides in percentages of base period output compared with present set-asides are:

Ingots from 25 up to 75; blooms, slabs, billets, except shell quality, each item up from 25 to 50; sheet rounds up from 50 to 75; tube rounds from 50 up to 100; structural shapes, heavy and wide flange, from 0 up to 100; plate, strip mill and universal mill, were 50 now 100; bars, hot-rolled, other, was 50 now 75; bars, cold-finished, was 50 now 75.

Standard pipe was 25 now 100; mechanical tubing, seamless and welded, was 50 now 100; pressure tubing, seamless and welded, was 50 now 100; wire, drawn, low and high carbon, was 50 now 90; sheet, hot-rolled, was 40 now 75; sheet, cold-rolled, was 40 now 75; strip, hot-rolled, was 25 now 50; strip, cold-rolled, was 25 now 50; castings, was 20 now 75; forgings, was 20 now 75; wire rope and strand, was 25 now 75; welded wire mesh was 15 now 75; and netting, was 15 now 75.

Steel Balance Nearer than You Think

Producers at AISI meeting predict easing in supply before end of year. Emphasize shortage not major worry. Inflation, lack of productivity, controls more to be feared

FEAR NOT about the future steel supply in the United States. This country is producing, expanding capacity and developing raw materials sources at a fantastic rate. Despite the drain of steel for defense, civilian supplies compare favorably with any previous year, except 1950.

But you well may be concerned over mounting inflation, productivity of labor, and the danger of prolonged bureaucratic controls.

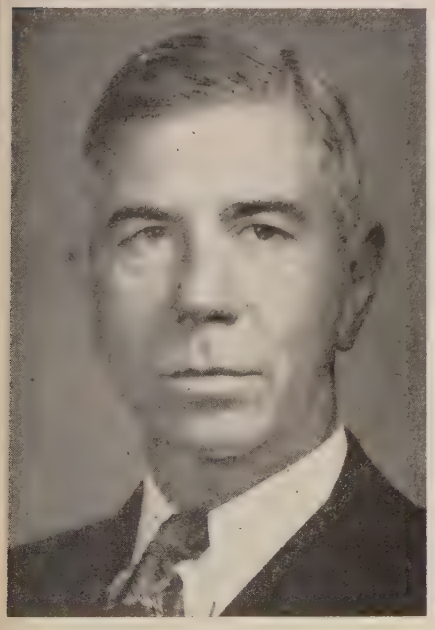
That was the word at the 59th annual meeting of the American Iron & Steel Institute at the Waldorf-Astoria, New York, May 23-24.

Balance May Be Near — Despite substantial increase in set-asides for defense and defense-support work, steel leaders believe that supply and demand for steel may come into balance much sooner than generally believed.

With markets for various consumer goods close to the saturation point and with federal curbs on credit, there may be at least a temporary period this year when there will be more steel than can be absorbed.

Jobs: $90,000—A decade ago, a new job in the steel industry cost from $10,000 to $15,000 to create. Today each new job being created at some steel plants calls for $90,000.

Thus C. M. White, Republic Steel president, illustrates the upsurge in cost of new facilities.



C. M. WHITE
. . . watch productivity

In 1946, the industry had a productive capacity of 92 million tons. This represented a total property investment of $5.8 billion. By the end of 1952, capacity will have increased 26 million tons to 118 million total. The 26 million ton increase will have cost the industry $5 billion, or a rate triple that for capacity installed before 1946.

Focus on Productivity—Mr. White believes the industry has a "mountain of work" to do in studying productivity and in obtaining full use of the expensive new facilities. "While dollars can increase production, unless more units are produced with the same human effort we have not increased our productivity."

B. F. FAIRLESS
. . . wins Bessemer medal

Failure to get productivity from new capital expenditures means wasted investment as far as the stockholder is concerned and the employees' stake and advantage in productivity must be clearly proved to him on a continuing basis.

How to increase productivity was the theme of the industrial relations section of the meeting. H. W. Johnson, Inland Steel, J. S. Kopas, Republic Steel, R. C. Cooper, U. S. Steel, and C. L. Houston Jr., Lukens Steel, were panel members. John A. Stephens, U. S. Steel, presided.

Steel for Civilians—Direct military use of steel during the third quarter will be about 700,000 tons finished rolled products per month, estimates Walter S. Tower, Institute president. That's less than one-eighth of prospective supply.

ELTON HOYT II
. . . ore will be forthcoming

Mr. Tower emphasizes that the United States, which has half the world's supply of steel for barely 6 per cent of the world's population, will have ample steel for powerful military forces, plus a civilian supply not much less than the tonnage so used in any year before 1950.

Large figures being circulated for "total defense steel requirements" and statements about the "shrinking availability of steel" are deceptive. The economy is being strengthened by the steel going into freight cars, oil and gas facilities, farm equipment and other common uses under government-sponsored programs. All these normally are considered civilian consumers.

Danger: Controls—"If there is any real ground for present concern," says Mr. Tower, "it is not how much steel may be left in the free market, but it is the grave question of what may be done to us by prolonged bureaucratic controls, imposed in the name of an emergency for which no ending is visible.

"Wherever the hand of government rests very long, bureaucracy begins to flourish. Bureaucracy, once rooted, rarely withers and never dies . . . Controls must not be allowed to exist beyond the time of imperative need."

Ore We'll Have—Elton Hoyt II, senior partner, Pickands Mather & Co., Cleveland, expresses confidence that iron ore will be forthcoming to meet the steel industry's expanding needs,

provided economic factors do not interfere with the "orderly and natural processes of our industrial structure."

The law of supply and demand must be allowed to operate normally to the greatest extent possible.

Mr. Hoyt believes there is little doubt that magnetic taconite can be concentrated satisfactorily and that further research will develop ways and means to include also in the concentration process, the non-magnetic material which is present in abundance.

Every effort is now being expended to develop the cheapest method of turning the powdery concentrate into a form suitable for the furnace and at the same time hard enough to withstand the rough handling encountered in shipment to distant furnaces. Experience justifies the conclusion that this can be done and at a cost competitive with ores from other sources without raising too much the ultimate cost of steel production.

Research, the Long View—Industry should take a longer range attitude toward research. While use of research has expanded greatly in recent years, much of it still takes a comparatively short range point of view. That's the opinion of Dr. Percy W. Bridgman of Harvard university, a Nobel Prize winner in 1946, who delivered the Charles M. Schwab Memorial Lecture.

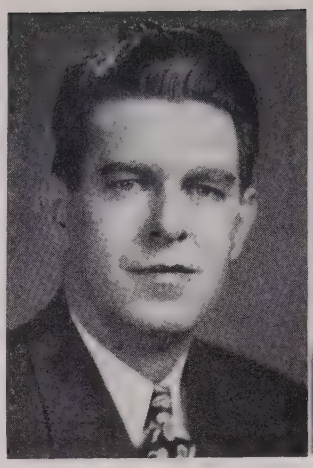
Industry cannot help but benefit if it will turn to more long range research aimed at understanding natural phenomena, says Dr. Bridgman.

Can Extend Range—For example, academic laboratory research has shown that steel behaves in unexpected ways under enormous laboratory pressures, and its changing properties indicate the possibility of new manufacturing processes to extend the present industrial range of steel products, he said.

Dr. Bridgman has worked for more than 40 years in the investigation of high pressures and their effect upon matter. For these investigations he was awarded the Nobel prize.

Knowledge of some effects of high pressure on steel was byproduct of general, purely academic work with hydrostatic pressure, but at least one practical advance in steelworking has resulted, and others are indicated, Dr. Bridgman said. By cold working the inside of heavy artillery with a pressure much in excess of the planned firing pressure, the service life of the gun barrel is considerably improved, he said. Pressures used today in "gun stretching" range up to 150,000 pounds per square inch, about the highest used in industry.

Bessemer Medal to Fairless—The British Iron & Steel Institute's Bessemer Medal was presented to Benjamin F. Fairless, U. S. Steel president, by Sir Charles Goodeve, representing the British insititute.



HENRY E. WARREN JR.

W. N. FLANAGAN

W. G. NICHOL

Edward L. Ryerson, Inland Steel chairman, became the tenth recipient of the Gary Medal. The presentation was made by E. G. Grace, Bethlehem chairman, in recognition of Mr. Ryerson's contributions to the steel industry and particularly for his leadership in the development of more favorable public relations for the industry. Others who have received the Gary Medal: James A. Farrell, Charles M. Schwab, W. J. Filbert, Julian Kennedy, Louis L. King, E. G. Grace, John B. Tytus, Quincy Bent and B. F. Fairless.

The AISI award went to W. N. Flanagan and W. G. Nichol of U. S. Steel Co. for their paper on "Materials Handling in the Steel Industry," which was presented last spring.

A new award, known as the Regional Meeting Technical Award was presented Henry E. Warren Jr., U. S. Steel Co., for his paper on "The Design of a New Open Hearth Shop," presented at the Pittsburgh and Birmingham regional meetings.

Abstracts from papers presented will be found on page 92, this issue.

Preside at Institute Technical Sessions

J. K. KILLMER
Bethlehem Steel Co.
(Raw Materials)

E. G. HILL
Wheeling Steel Corp.
(Sinter)

P. R. WRAY
U. S. Steel Co.
(Plant Operation)

K. L. FETTERS
Youngstown Sheet & Tube
(Steelmaking)

Good Living by 1953

Defense Mobilizer Wilson predicts a civilian economy at or near pre-Korean levels

"WE SHOULD be able to support a civilian economy at or near pre-Korean levels by the end of 1953," says Defense Mobilizer Charles E. Wilson. He spoke before an annual meeting of the National Industrial Conference Board in New York.

We'll support the economy despite the fact that some $50 billion a year will be spent on defense in 1951, 1952 and 1953. Mr. Wilson says we are now spending for defense at the rate of about 10 per cent of the gross national product. That will rise to about 15 per cent at the end of 1951. At the height of the program it will probably not exceed 20 per cent of the gross national product, as against 45 per cent at the peak of World War II.

Higher and Higher—At the end of 1950, our gross national product was nearly $300 billion a year. By the end of 1953, our gross product should amount to nearly $350 billion a year at present price levels. Military orders are being placed at the rate of $1 billion a week. Thus far, nearly $30 billion has been obligated, and by July 1, 1952, an additional $55 billion worth of orders will have been placed. By the end of this year, military orders will be translated into delivery of end items, including new plant facilities, at the rate of $4 billion a month.

Mr. Wilson says our most severe shortages are in the alloying metals—tungsten, manganese, vanadium, chrome, nickel and cobalt.

The program for stockpiling must continue, says Mr. Wilson, although we can let up on some raw materials from time to time. Our present stockpile resources are valued at more than $3 billion.

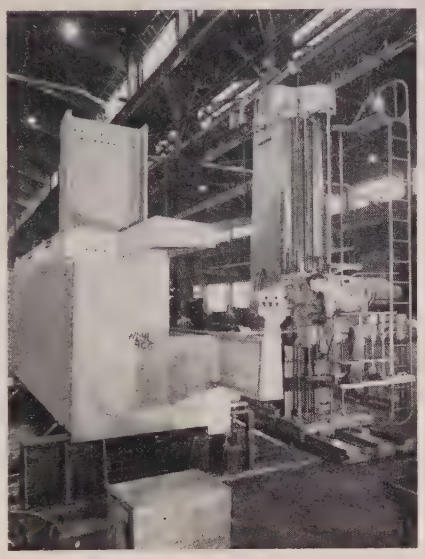
Same Officials—These officers were re-elected by the conference board to serve one year: Chairman, Neal Dow Becker, Intertype Corp.; vice chairman, Cola G. Parker, Kimberly-Clark Corp.; vice chairman, Langbourne M. Williams Jr., Freeport Sulphur Co.; vice chairman, James D. Wise, Bigelow-Sanford Carpet Co. Inc.; chancellor, Virgil Jordan, New York; president, John S. Sinclair, New York; treasurer, Rolland J. Hamilton, American Radiator & Standard Sanitary Corp.; and secretary, Clyde L. Rogers, New York.

Rail Steel Bar Shipments Up

Shipments of rail steel bar products during first four months this year were 20 per cent ahead of the corresponding period of 1950. But near exhaustion of inventories of re-rolling rails makes curtailment of operations appear likely soon. That outlook was painted at the annual meeting of the Rail Steel Bar Association in Chicago last week.

Normal rail inventories range from 3 to 5 weeks, but several companies currently have only from 2 to 2½ weeks. In one or two instances only one week's supply is on hand.

Rail rerolling mills so far this year have been operating two turns per day, or 80 hours per week. At present, however, releases of rails by railroads are at a rate which will provide work for only 24 hours a week.



DELICATE OPERATION: Close watch is kept over precision milling of an aircraft landing gear testing machine section at Dravo Corp.'s Pittsburgh plant. The work is being done on a recently-installed Giddings & Lewis high power precision horizontal boring, drilling and milling machine. A tungsten carbide cutter is used here

Shipments of rail steel products in 1950 were 22 per cent higher than in 1949, which makes the high rate of activity for the first four months of 1951 all the more impressive. The recent high level of activity was made possible by the doubled inventories of rerolling rails early this year, a situation resulting from substantial imports in the last quarter of 1950.

Frank C. O'Brien, president, Burlington Steel Co. Ltd., Hamilton, Ont., was elected chairman of the association's board of directors, to succeed A. C. Weber, director of research and sales engineering, Laclede Steel Co., St. Louis. New treasurer is Howard W. Beatty, assistant manager of sales, rail steel and reinforcing bar division, Inland Steel Co., Chicago.

Strings Loosened on MRO

Price rises and increased needs influence NPA to relax limits on purchases for maintenance

THE National Production Authority loosened some of its strings on MRO.

It felt the change was necessary in view of increased prices, accelerated production and expansion programs.

Prices on maintenance, repair and operating supply items have increased about 10 per cent over the base period average. As a result organizations weren't getting as much material as they were during the base period, inasmuch as limitation is on a dollar expenditure basis.

At the very time businesses were getting less because of the price factor, plant expansions and increased use of available facilities created a demand for more MRO items. This increased demand was estimated at 10 per cent.

Compensations—To compensate for these factors, NPA raised the ceiling on expenditures permitted in use of a defense order rating DO-97 to a rate of 120 per cent of the base period rate. The limit had been 100 per cent. The change was effective May 22 through an amendment of that date of NPA Regulation 4.

In addition to the use increase the amendment makes other changes to provide flexibility and to reduce the flow of applications for quota adjustments. The other changes are:

1. Any organization that uses the DO-97 rating to get 20 per cent or less of its quarterly quota will be permitted also to purchase an unlimited MRO total without use of the rating, subject to inventory and use limitations and any restrictions contained in other NPA orders.

2. The amended order permits a choice of base period: Either the calendar year or the nearest fiscal year ending before Mar. 1, 1951.

3. DO-97 use for capital additions is limited to 10 per cent of the quarterly quota or to $750, whichever is higher.

4. Companies which have more than one plant within the United States and its territories and possessions now have the option of deciding whether MRO quotas shall be established for each plant individually or for the organization as a whole.

5. DO-97 cannot be used to obtain material on lease.

NPA in Freight Car Switch

Freight car production will be cut 23 per cent starting July 1 as a result of the most recent NPA decision

affecting rail equipment companies. News of the ruling was revealed by Sen. Edwin C. Johnson (Dem., Colo.), chairman of the Senate Commerce Committee, who said car builders will get only enough steel to make 7600 units a month in third quarter—a complete reversal of NPA's previously announced policy of pushing for a 10,000-monthly goal.

New locomotives are being placed in service at a rate far ahead of last year's pace. Class I railroads installed 838 in the first four months of 1951, compared with 691 put in by May 1, 1950, reports Association of American Railroads. Orders for new locomotives, backlogged as of May 1, totaled 1755, an increase of 644 over the 1111 on order the same date last year. A breakdown shows 1733 of the new orders are for diesel, 18 for steam and four electric.

STEEL's Weekly Summary of Subcontract Opportunities

SMALL BUSINESSES alert for opportunities to enter defense production may find them by keeping big suppliers in mind as sources of good sub-subcontracts.

Importance of this approach is illustrated by the order backlog held by one large supplier, Ryan Aeronautical Co., where $3.5 million in new commitments was added recently to the $30 million already on the books. Latest orders listed by the San Diego firm include exhaust systems for Wasp Major engines from Ford Motor Co. and subcontracts from Westinghouse, Pratt & Whitney, General Electric, Douglas, Boeing, Fairchild and Continental Motors Corp. for jet engine components and exhaust systems.

Prime contracts of interest to the metalworking industry follow:

PRODUCT	CONTRACTOR
Air Turbine Starters	Garrett Corp., Los Angeles
Diesel Pyrometers & Thermocouples	Bristol Co., Waterbury, Conn.
Barges (deck cargo)	John E. Matton & Son Inc., Waterbury, N. Y.
	Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
	Island Dock Inc., Kingston, N. Y.
	Calmes Engineering Co., New Orleans
	Avondale Marine Ways Inc., Westwego, La.
	Kewaunee Engineering Corp., Kewaunee, Wis.
Air Compressors	Davey Compressor Co., Kent, O.
	Le Roi Co., Milwaukee
	Worthington Pump & Machinery Corp., Los Angeles
Automatic Torque Testers	Asch Equipment Co., Long Island, N. Y.
Heater Assemblies	Surface Combustion Corp., Toledo, O.
	Stewart Warner Corp., Indianapolis
Transmission Assemblies	Kenworth Motor Truck Corp., Seattle
Fuel Pump Assemblies	P. L. Grissom & Son Inc., Detroit
Gear Assemblies	Diamond T Motor Car Co., Chicago
Adaptor Assemblies	White Motor Co., Cleveland
Motorcycles	Harley-Davidson Motor Co., Milwaukee
Pumps (reservoir)	Oilgear Co., Milwaukee
Crushing & Screening Plant	Universal Engineering Corp., Cedar Rapids, Iowa
	Pioneer Engineering Works, Minneapolis
	Iowa Mfg. Co., Cedar Rapids, Iowa
Cranes	Insley Mfg. Corp., Indianapolis
Clamshell Buckets	C. S. Johnson Co., Champaign, Ill.
Gravity Roller Conveyors (10 ft. sections)	E. W. Buschman Co., Cincinnati
	Standard Conveyor Co., St. Paul
Sphere & Valve Assemblies (aircraft)	American La France Foamite Corp., Elmira, N. Y.
Airplane Fuel Pumps	Pesco Products Div., Borg-Warner Corp., Bedford, O.
Fuel Pumps (maintenance parts)	Thompson Products Inc., Cleveland
Fuel Tank Units	Minneapolis-Honeywell Regulator Co., Minneapolis
Bomb Rack Releases	R. E. Dye Machine & Supply Co., Breckenridge, Tex.
Automatic Pilot Assemblies	Sperry Gyroscope Corp., Great Neck, Long Island, N. Y.
	Lackner Co. Inc., Cincinnati
Bomb Lift Trailers	Globe Hoist Co., Philadelphia
Aircraft Valves	David Clark Inc., Worcester, Mass.
Hydraulic Valves	Hydro-Aire Inc., Burkank, Calif.
Trainers	Link Aviation Inc., Binghamton, N. Y.
Aircraft Oil System Assemblies	Bellanca Aircraft Corp., New Castle, Del.
Dolly Assemblies	Tubular Aircraft Co., Los Angeles
Inverters & Special Tooling	Oster Mfg. Co., Cleveland
	Lion Mfg. Corp., Chicago
Recorder Assemblies	Link Aviation Inc., Binghamton, N. Y.
Electric Drive Assemblies	Marlowe Pumps, Ridgewood, N. J.
Radio Transmitter Power Junction Boxes	Sylvania Electric Products Corp., Buffalo
Radio Sets	Radio Corp. of America, Camden, N. J.
Radar Beacons	Radio Corp. of America, Camden, N. J.
Public Address Systems	Radio-Television Supply Co. Inc., Los Angeles
Speaker—Transformer Assemblies	Stromberg-Carlson Co., Rochester, N. Y.
Inverters & Generators	Jack & Heintz Precision Industries Inc., Cleveland
	Holtzer Cabot Inc., Boston
Generators	Sunbeam Corp., Chicago
	Jack & Heintz Precision Industries Inc., Cleveland
	Fairbanks, Morse & Co., Chicago
Capacitors	Radio Condenser Co., Camden, N. J.
Indicators	Kollsman Instrument Corp., Elmhurst, N. J.
Resistors	Van Dyke Instruments Inc., St. Petersburg, Fla.
Electronic Tubes	Continental Electric Co., Geneva, Ill.
Magnetron Tubes	Litton Industries, San Carlos, Calif.
Connectors	Magnavox Co., Ft. Wayne, Ind.
Transformers	Standard Electric Products Co., Dayton, O.
Amplifiers	Air Associates Inc., Teterboro, N. J.
Processing Machines	Morse Instrument Co., Hudson, O.
Compass Assemblies	Kearfott Co. Ltd., Little Falls, N. Y.
Analyzers	Weston Electrical Instruments Corp., Newark, N. J.
Automatic Chargers	Walter Kidde & Co. Inc., Belleville, N. J.
Jacks	Gilfillan Bros. Inc., Los Angeles
Electric Motors	Vickers Inc., Detroit
Periscope Mounts	R. Hoe & Co. Inc., New York

San Francisco Plans Scrap Drive

Plans were formulated in San Francisco last week to place into operation the first major concentrated steel and iron scrap collections drive since World War II.

The drive is being directed by a committee comprised of industrial leaders under the chairmanship of O. L. Pringle, vice president of Columbia Steel Co., subsidiary of U. S. Steel Corp. The San Francisco committee has been designated the coordinating group for the scrap drive in northern California by the National Production Authority.

At an organizational meeting decisions were made to concentrate first on generating as much scrap as possible in the way of obsolete machinery and bed plates in industrial plants, factories and shops and then to spread the campaign into the farm areas.

Mr. Pringle said the committee has no plans now for a "pots and pans" drive, but emphasized the public can play a big part in the campaign by selling old pieces of steel and iron lying around in basements, garages and yards through small dealers.

Subcontracting at Wartime Rate

Two companies that will figure heavily in the subcontracting plans of many small businesses say they will subcontract components on future defense orders at a rate approaching World War II proportions.

Pratt & Whitney Aircraft Corp. division of United Aircraft Corp., reports it will pay $250 million in 1951 for subcontracted parts. Included in the engine division's list of suppliers are 5285 companies, 90 per cent classed as small businesses employing less than 500 each. Additional subcontractors will be required to support the production program for the two axial-flow gas-turbine engines designed and developed by P&W. Proportion of subcontracting on the new type engines will equal the present 50 per cent ratio, says J. W. Dunnell, purchasing manager.

Increased military orders received by Westinghouse Electric Corp.'s Electronics and X-Ray Division in the first four months of 1951 promise expanded subcontracting along the pattern set in World War II, reports Walter Evans, vice president. In 1950, 64 per cent of the division's total military bookings were farmed out to 2361 suppliers in 32 states and Canada.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U.S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

HIGH TENACITY RAYON YARN—Amendment of May 17, 1951, of NPA Order M-13 increases to 30 per cent the amount of monthly scheduled production of high tenacity rayon yarn a producer must set aside for filling defense-rated orders. Set-aside ceiling previously was 15 per cent. New amendment was effective May 17, 1951.

RUBBER—Amendment of May 21, 1951, of NPA Order M-2 is designed to make clear the inventory limits on tires. Amendment effective May 21, 1951.

IRON & STEEL—Amendment of May 18, 1951, of NPA Order M-1 assures steel converters of a carbon steel supply of at least 90 per cent per month of their average monthly usage in the first eight months of 1950. Excluded is carbon plate for line pipe. Amendment effective May 18, 1951.

NPA Regulation

MRO—Amendment of May 22, 1951, of NPA Regulation 4 relaxes some of the restrictions on the use of defense order rating DO-97 for procurement of maintenance, repair and operating supply items. Now the rating can be used to obtain in a quarter up to 120 per cent of the quarterly average dollar amount of MRO items bought during the base period. Anyone using a DO-97 for 20 per cent or less than his quarterly quota will be permitted also to purchase an unlimited MRO total without using the rating. Amendment effective May 22, 1951.

Price Regulations

MANUFACTURERS' PRICES — Admendment 3 of Ceiling Price Regulation 22 clarifies and corrects various sections of the general manufacturers' pricing regulation. For the most part, changes are made in sections of the order dealing with calculating increases in factory labor and materials costs. This amendment, issued May 17, 1951, also seeks to ease the reporting requirements of the order and to clarify the description of exempt products listed in Appendix A of the order.

MACHINERY PRICES — Supplementary Regulation 1 to Ceiling Price Regulation 30 provides an alternative pricing method for machinery manufacturers. Under this alternative method a manufacturer may adjust ceilings set by the General Ceiling Price Regulation of Jan. 26 instead of adjusting the prices prevailing in his pre-Korean base period.

MILITARY EXEMPTIONS—Amendment 1 to General Overriding Regulation 9 exempts various industrial manufactured goods of a strictly military nature from all Office of Price Stabilization price control.

MACHINERY PRICES—A correction issued May 21, 1951, by the Office of Price Stabilization to Ceiling Price Regulation 30 straightens out a clerical error in Section 43 (d).

COKE, CHEMICALS, GAS—Amendment 1 of Supplementary Regulation 13 to the General Ceiling Price Regulation corrects several sections pertaining to producers of coke, coal chemicals and coke oven gas.

AIRCRAFT & PARTS—Amendment 1 issued May 23, 1951, to Ceiling Price Regulation 30 specifically puts aircraft and aircraft parts under CPR 30.

SMALL BUSINESS—Amendment 2 issued May 23, 1951, to Ceiling Price Regulation 30 permits machinery manufacturers with gross sales below $250,000 to stay under the General Ceiling Price Regulation (the general freeze) of Jan. 26 if they so elect.

WHERE THE COMPONENTS GO: Workers at Ryan Aeronautical Co. inspect a General Electric J-47 turbojet engine, cut away for study of internal operation. GE is staging a nationwide tour of plants providing component parts for the powerful J-47 so that workers can see the end product to which they are contributing

Sales Lifted, Too

Materials handling equipment sales soar to $1.2 billion in 1950, but '51 view is cloudy

MATERIALS handling equipment sales hit $1.2 billion in 1950, up 60 per cent from 1949, but the 1951 picture is clouded by materials shortages and government controls.

That was the consensus among members of the Material Handling Institute, Industrial Truck Association and Caster & Floor Truck Manufacturers Association who met at White Sulphur Springs, W. Va., last week. This year order backlogs on industrial trucks, conveyors, hoists, cranes and similar material handling equipment have risen as much as 350 per cent from a year ago and deliveries take eight or nine months.

Forced To Pay—Some companies have been forced to buy high-priced foreign and domestic steel to keep production going. One executive said he even had to enter the black market for sheets to make good on a government rocket contract.

Feelings on the Controlled Materials Plan are mixed. Some expect to save money under the plan since they have been spending a lot on procurement. Others think fourth quarter, when the plan actually becomes operative, will be rugged unless more of the orders on their books are reclassified as direct defense or defense-support business, so mandatory material allocations will apply.

Problems in Prices—Makers of material handling equipment, like other manufacturers, asked for a minimum 30-day delay in the May 28 effective date of CPR 30. Application of individual company price rollbacks is expected to result in competitive hardships.

Study is being given to working out a uniform industry pricing plan for some lines of equipment under regulations limiting profits.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Think your industry will get the short end of the stick on materials or pricing because you haven't got an advisory committee? Here's a procedure to follow

IF YOUR INDUSTRY is one of the many for which NPA and OPS so far have failed to organize advisory committees, the omission probably traces back to a recent ruling by the Justice Department. The ruling provides that an industry advisory committee may be formed only when the need for it has been shown and when a meeting is to be scheduled in the immediate future. Thus, many committees which exist on paper, and whose members have been invited and expressed a willingness to serve, have not yet been "formalized."

The situation makes a lot of industry people unhappy because they figure that without active industry advisory committees they stand a good chance of getting the short end of the stick on problems relating to materials and pricing. A good example is the disgruntlement among foundrymen over the lack of committees for different branches of their industry.

Day in Court—There is a procedure to be followed by such industries as feel they are being deprived of their day in court. In the case of NPA, they should state their case to G. Lyle Belsley, director, Office of Industry Advisory Committees, 5212 Commerce Bldg., Washington 25. At OPS, such matters are under Mrs. Ethel Gilbert, director, Office for Advisory Committees, 8-214 Temporary E Bldg., Washington 25.

After all, the Defense Production Act states: "Where necessary to meet the intent of Congress, committees shall be appointed."

Paper Committees: Practically Worthless

Salesmen: Watch for Scrap!

Steel mill, steel warehouse and castings salesmen are being invited to participate actively in the ferrous scrap drive being promoted by the National Production Authority. They are urged to place themselves at the disposal of the Scrap Mobilization Committees being organized locally throughout the country by chambers of commerce and similar organizations. The salesmen, it is believed, can do a fine job in helping to locate dormant scrap in the plants of their customers. The scrap drive is under direction of Edward W. Greb, chief, Industrial Reclamation Branch, Conservation and Reclamation Division, NPA. Mr. Greb is at 2236 Temporary T Bldg., and can be phoned on STerling 5200, Extension 4918.

Finding Foreign Business . . .

If you are not on the mailing list of the Economic Cooperation Administration's Office of Small Business you may be missing out on attractive business opportunities. Every day the Office of Small Business sends out circulars containing leads to business opportunities in Marshall Plan countries. Requests should be mailed to the ECA Office of Small Business, 800 Connecticut Ave. N.W., Washington 25.

Tools for Britain . . .

Conferences of British government machine tool men and National Production Authority officials closed with the conclusion that the British will be able to get from this country the tools they need for armament manufacture without interfering with United States requirements. What turned the trick was careful scheduling on the basis of shipping dates and the making of substitutions for certain critical, scarce machines that are to be delivered where they can be used with most effectiveness. So far DO ratings have been authorized for about 4000 tools for the British. The number is to be increased substantially.

Not Feeling the Draft?

While many capital goods manufacturers—the machine tool builders, the tool and die makers, etc.—have expressed worry over the possibility that inductions under the Selective Service Act might take many of their most promising young mechanics, only one request for help in getting a deferment has been received so far by the National Production Authority. The inference is that the current worry has little basis at the present juncture. Incidentally, NPA made a recommendation in the above case and the local draft board granted deferment to the individual involved.

Saving Critical Metals . . .

Credit for a whale of a conservation job must be given to the National Advisory Committee for Aeronautics. Through research work at the NACA laboratory at Cleveland, and in close co-operation with the industry, the way has been paved for substituting less critical for highly critical materials in aircraft engines both for the armed services and privately-owned airlines. Details are highly restricted—but in a general way the metals conserved are mostly in the field of high temperature alloys, including columbium, tungsten, cobalt, chromium and nickel. A comparable conservation study now is under way by NACA's Subcommittee on Aircraft Structural Materials.

Machinery Men Assigned . . .

New industry recruits in the National Production Authority have been given assignments in the Machinery and General Industrial Equipment Divisions. Robert Scott, on leave from Hyster Co., Portland, Oreg., will handle fork-type lift trucks. Francis A. Kelly, Cleveland Twist Drill Co., will assist Wiley Buchanan on cutting tool problems. George Cole, Miehle Printing Press & Mfg. Co. and Dexter Folder Co., Chicago, will handle printing and publishing machinery. A number of other industry machinery men will be added as soon as their papers have been cleared. Under a shift in the division, Joseph C. Fitzgerald, who has been serving as general machinery consultant, will specialize on rolling mills and wire drawing equipment.

Touch and Go for Steel Raw Materials

NPA believes the steelworks expansion is attainable, but it is increasingly concerned about raw materials to feed the added capacity

NATIONAL Production Authority officials believe that the entire steelworks expansion program now under way is possible of attainment but that its execution will require the successful and continuous co-ordination of a great many subsidiary programs.

In reaching that conclusion producers and government authorities have had in mind a capacity, as of July 1, 1953, of 118 million net tons of steel ingots, 3.5 million net tons of steel castings, 17 million net tons of gray iron castings and 1.6 million tons of malleable castings. While these figures are by no means the fixed goals, they are useful for making necessary calculations.

Basic Headache—To date, major attention has been given to the problems in raw materials. Many problems remain for intensive study—as reasonably balanced facilities, such as coke ovens, blast furnaces, refractories, a great variety of mills and other finishing, fabricating and service units, transportation, new gas lines and railroad facilities, ships, mining, water, dredging, power generation and transmission, electrical and mechanical plant equipment. And provision must be made for hiring and training manpower, with due attention to housing and other facilities.

To feed an industry capable of producing 121.5 million tons of steel and 18.6 million tons of cast iron, pig iron and scrap would be required in the amount of 150.7 million tons annually. Where is all this metal coming from? Of course no definite answer is evident now, so several assumptions must be made. Some estimates indicate that scrap will be available in the amount of about 68 million net tons annually by July 1, 1953. That would make it necessary to provide 82 million net tons of pig iron. Present blast furnace capacity is rated at 71.4 million tons a year.

That leaves an apparent pig iron deficit of more than 10 million net tons. About 8 million tons of this deficit can be taken care of by certificates of necessity already issued or recommended, leaving a remaining deficit of nearly 3 million tons.

Relief—As steel authorities look at the picture, it should be possible to make up part or all of this deficit of 3 million tons through enlargement of old furnaces, by use of improved raw materials and equipment and adoption of new production methods.

Preliminary analyses have revealed a lot must be done by the steel industry in regard to iron ore, of which 144 million net tons or 128.6 million gross tons would be required to produce 82.3 million net tons of pig iron. Allowing for other industrial uses, total iron ore requirements as of July 1, 1953, would be at the rate of about 152 million net tons or roughly 136 million gross tons annually. Part of this increased load could be taken care of by the expanded Great Lakes fleet which in 1953 should be able to move 100 to 103 million gross tons of ore as compared with an expected 89 million tons in 1951.

A large part will come from the construction of ocean ore carriers. Until heavy imports begin to arrive, the ore movement from the Lake Superior district will have to be expanded to around 96 million gross tons.

A factor in necessitating this expansion in lake ore production will be the necessity for carrying much larger inventories of ore at blast furnaces than have been kept in the past.

Solution Coal—Much also must be done about coke. Total coke requirements as of July 1, 1953, are estimated at 93 million net tons. Coke capacity at beginning of 1951 was rated as 81.7 million net tons. To supply the indicated deficit, more coal mines must be opened up, production at existing mines increased, much new mining equipment will be needed, and more coal cleaning plants will be necessary. The whole situation is being studied by NPA with the Defense Solid Fuels Administration in co-operation with industry, with the primary aim of determining the new coke oven capacity that will be needed.

One of the factors being considered is the possibility of utilizing more natural gas to cut down use of coke and coal for domestic heating purposes.

Special attention will have to be given to such other important materials as fluxes, refractories, many alloys and metals, and to thousands of articles required for building and maintaining an integrated supply industry. In the field of machinery and equipment the greatest difficulty probably will surround the procurement of electrical equipment calling for large resources of copper and other metals and for adequate skilled labor. The load on refractories specialties, as silica shapes for coke ovens, probably will require more capacity than now in operation or under construction.

SIDE PUSHERS: Two General Electric 40-ton side-arm pusher locomotives go to work at Baltimore & Ohio Railroad Co.'s new ore dock on Curtis Bay in Baltimore. They operate on a special narrow-gage track between standard railroad tracks, on power supplied by a 250-volt third rail. Pincer-shaped arms spring out from both sides of the locomotive to move two lines of freight cars simultaneously when necessary

Die Casting Sales: The Pattern May Be Like '50

Source: American Die Casting Institute, May, 1951

Big Problem for Little Die Casters

THERE'S a big problem ahead for little die casters.

It's the problem of trying to exist under the growing weight of pyramided government restrictions.

Speaking at the 33rd annual meeting of the American Zinc Institute in St. Louis last week, David Laine, secretary of the American Die Casting Institute, touched on materials limitations and credit restrictions and asserted there is no doubt "the effect of pyramiding restriction upon restriction cumulatively will be felt in the die casting industry."

To the materials-credit situation he said, "must be added supply dislocations such as stockpile commitments or demands and international problems of world supply and demand.

"The weight of these many complicated problems falls unevenly upon our industry both as to time and place, and this poses a serious problem. Many small die casters," Mr. Laine predicted, "may, and probably will, be hurt severely by the fourth quarter of this year unless some remedial measures can be devised.

"The rest of the industry probably will manage to do well until early 1952," Mr. Laine believes.

Overall, the die casting industry's volume of business in 1951 will not decline radically from the 1950 level, he predicts. In 1950 the sales of die castings totaled $225 million (see accompanying chart). That amount included $135 million in zinc die castings. Most of the remainder was aluminum die castings.

The transportation industry was the biggest user of zinc die castings in 1950. It took 51 per cent of those produced. Details on end use distribution of zinc die castings from job shops in 1950 are shown in the accompanying table.

Nevada Titanium Project O.K.'d

Titanium Metals Corp. of America, Henderson, Nev., was granted a certificate of necessity for a $14,162,840 titanium metal project. The company was allowed to write off 90 per cent of the cost under the authorized accelerated tax amortization program designed to speed up building of the nation's production machinery.

Aluminum Production Rises

Production of primary aluminum in the United States increased 5 per cent during the first quarter over the total for the last quarter of 1950. The industry turned out 140,044,429 pounds of primary metal in March, to bring the quarterly total to 401,431,462 pounds, compared with 382,176,940 pounds for the previous quarter.

"This is about 25 per cent more than was produced during the first quarter of 1950," said Donald M. White, secretary, Aluminum Association, New York.

Where Zinc Die Castings Went in 1950

(Output of job shops only)

End Use Group	Per Cent of Total Sales	Estimated Pounds (thousands)
Mining, Construction & Agricultural Machinery & Equipment	0.9	3,000
Transportation—Motor Vehicles (Except Military)	51.0	173,250
Transportation—Miscellaneous (Except Military)	2.0	7,000
Industrial & Commercial Machines, Tools & Equipment	7.3	25,000
Communication Equipment & Electronic Devices	2.7	9,250
Office Equipment Machines	1.9	6,250
Plumbing, Heating & Builders' Hardware	6.7	23,000
Photographic & Optical Scientific Measuring, Recording, Medical & Control, Laboratory Instrument & Equipment	2.6	8,750
Timing Devices, Clocks, Time Operated Devices	0.9	3,000
Home Appliances & Equipment	20.9	71,000
Sporting Goods, Jewelry, Personal Goods, Toys	2.9	9,750
National Defense	0.2	750
TOTAL	100.0	340,000

Japan's Economy Up

The Korean War has been a shot in the Japanese economic arm as textiles, steel, lead advance

THE KOREAN war has spurred Japan's economic recovery.

In the first seven months of 1950, industrial activity improved, but only moderately. At yearend, the index reached 131.6 (1932-1936=100), but the average for the year was only 110.4, says the Commerce Department.

Leading—Spearheading the industrial production was steel ingot output of 5.3 million net tons, compared with 3.3 million in 1949, but 10.1 million in 1943. Although substantial production increases were registered for a number of machinery lines, the overall machinery index for 1950 was a little lower than attained in 1949. General activity in the machinery field, which fell to relatively low levels during the first half of 1950, advanced considerably after midyear. The major 1950 declines were in reciprocating steam engines, gas turbines and diesel and other heavy oil engines.

Production advances were made in iron and steel mill equipment, plant and mining machinery. Textile machinery output advanced generally over 1949 figures because of greater production of carding machines, spinning frames and industrial sewing machines.

Salt Air—Shipping and shipbuilding become increasingly greater mainstays of the Japanese economy. As of Apr. 30, 1951, the nation has 126 ocean-going vessels aggregating 742,500 gross tons. From 1930-1934, Japanese shipping carried an average of 65 to 70 per cent of the country's exports and imports. Today, Japan must depend even more on shipping as one of the indispensable means for survival. She must import much of her food and key raw materials and can keep costs of those within her reach only by using her own bottoms.

Shipbuilding activity was greater in 1950 than in either 1948 or 1949 but there was a slight drop in the tonnage and number of new vessels actually completed. New ship construction still fell far short of the 800,000-ton yearly capacity presently attributed to the shipbuilding industry which consists of 11 major and numerous smaller yards employing 800,000. Since 1948, 38 vessels (aggregating about 150,000 gross tons) on foreign account enriched the nation by some $40 million.

No More—Despite that earning, the industry has now reached a stage where it cannot take further foreign orders without the inducement of superior workmanship and low building costs, for which her ravaged facilities are ill equipped. Shipbuilders are keeping busy on repair work and conversion of wartime vessels.

Japanese prices are now nearly two and a half times the 1934-1936 average. The labor situation is quiet and employment rising. Individual cash wages paid by industry to workers in establishments having 30 or more paid employees rose from a monthly average of $23.31 in November, 1949, to $28 in November, 1950.

A Little Up—Japan's total trade in 1950 (imports plus exports) aggregated about $1,778,800,000, an increase of about $364.3 million over the 1949 total. Imports were valued at $958.6 million and exports at $820.2 million. The import figure was up 6 per cent from 1949, the export level up 60 per cent. Textiles account for nearly 50 per cent of Japan's total exports. Iron and steel products, chemicals and miscellaneous consumer goods are other important items.

Reds Expand Faster

Production behind the Iron Curtain is increasing slightly faster than in the Western World, says the United Nations Economic Commission for Europe.

Western Europe boosted output 13 per cent in 1950 over 1949, the U. S. 20 per cent, Russia 23 per cent, Soviet satellites 22 per cent. East Germany accounted for more than a third of the latter boost. Russia's 1950 production, says ECE, was 73 per cent higher than in 1940 and 17 per cent higher than was contemplated at the launching of the first five-year plan in 1945. Coal and oil did not greatly exceed the planned levels and the timber industry failed to reach its goal.

ECE says all Iron Curtain nations are basing their expansions on the raw material potentialities of the territories in the eastern part of Russia. Russia, particularly, is now drawing significant amounts of vital coal, iron, oil and steel from the distant Urals and central Asia.

World Unit To Hike Output

The U. S., Britain and France are setting up international machinery to expand production of scarce materials and distribute them most effectively among free nations.

Commodity control groups will be formed soon to deal on a global scale with the scramble for rubber, tin and other commodities.

Black Star

SHIPPING AND SHIPBUILDING: MAINSTAY OF NIPPONESE ECONOMY
. . . since 1948, 38 vessels enriched the nation by $40 million

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Now that the ax has definitely fallen on auto production, auto people are making more pointed criticism of the way mobilization is being handled

DETROIT

IT HAS appeared for months as though the prophets of doom in the automotive industry were off the beam when they talked of impending production cuts, mass unemployment, lagging fruition of defense contracts.

After arousing in the public a scare psychology which resulted in nearly hysterical buying of all kinds of consumer durables, spokesmen of this bent beat a hasty retreat and have been trying ever since to figure out where they went wrong. All that was in error was their timing. Almost at hand now are several of the dislocations of the economy which they had predicted.

The Cut at Last—Automobile production is to be cut substantially. Unemployment is a spectre which may appear in this area suddenly. A booming passenger car industry is about to turn into an infant defense arsenal. Now that the long-expected conversion is imminent, automotive people, who have been soft spoken in public up until now about the defense effort, are beginning to release some pent-up comment.

Henry Ford II laid on the line the facts of industrial life as they are seen at this time by many of the automotive industry's top officials. Addressing members of the National Security Industrial Association when they toured Detroit plants, he said, "there must be a lot more realism in the approach to mobilization on the part of some of those in Washington. If this assignment is to be carried out successfully, we must be freed as soon as possible of uncertainty and confusion and trial balloons—such trial balloons as the recent Washington-born rumor that told us steel for automotive production in the second quarter was to be cut 40 per cent.

Forty per cent was the rumor, 20 per cent was the fact. And we can't plan our business on rumors.

Too Much Guesstimating—"We must do away with guessing what material and manpower needs are going to be—guesses like those which finally resulted in an estimate of third-quarter steel requirements for defense and so-called supporting industries totaling more than the entire available supply."

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	684,144	585,705
May		732,161
June		897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Week Ended	1951	1950
May 5	154,523	146,337
May 12	158,502	174,480
May 19	160,467	178,314
May 26	161,000*	186,249

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Taking a swipe at CMP, he recommended that its scope should be determined very carefully. "Let's not, for instance, have 85 per cent control of steel in a defense effort that demands only 15 or 20 per cent of our total production," he advised.

Eager To Co-operate—Emphasizing that his company is eager to get further into the defense program and is in sympathy with Defense Mobilizer Wilson's goals, he explained that he believes one of business' most important jobs at the moment is "to make every effort to help Washington in reaching sound, basic decisions.

"These decisions," he said, "must withstand pressure from any particular segment of our economy, withstand any kind of political pressure, however strong and impelling the motive may seem.

Jockeying Is Out—"We in industry must realize that we cannot get this job done if any one particular group insists on jockeying for preferred position during this period of materials shortages."

Because of further materials restrictions, chiefly steel, Ford will have to lay off 10,000 workers in the next two months to keep overhead costs below prohibitively high levels at the lower auto production rate. "We simply can't rehire these people for many months to man still-on-paper war materiel production lines," he stated.

Unions May Bring Action—Union castigation of controls which are making furloughing of Detroit automotive workers certain has not yet reached Washington's ears.

But it will be recalled that when overly severe materials use limitation orders were promulgated earlier union opposition resulted in some easing. If distribution of the "free" materials after CMP goes into effect is inequitable or if widespread unemployment results from the new steel use orders, a blast from Walter Reuther's UAW may well result in lightning-quick designation of all consumer durables as "essentials" worthy of protection under the CMP umbrella.

UAW Starts Membership Drive

For the moment the UAW is aiming its vituperation at industry, rather than government. "Big companies," the union charges in its magazine *Ammunition,* "for political and marketing reasons have undertaken a deliberate decentralization program . . . . The companies today are collecting huge grants from the federal treasury to build new factories in places where the pay rates are 60 to 70 cents below UAW rates." An intensive organizing drive is to be conducted to eliminate this "substandard competition."

UAW's international executive board laid out the union's new strategy. Emphasis will be on unorganized plants which compete with UAW units. The number of such plants, an incomplete survey by UAW Vice President Richard Gosser shows, runs into the thousands. Special attention will go to foundries, where the union says wage differentials between organized and unorganized shops range from 60 cents to $1 an hour. But the aircraft industry, farm implement plants and Canadian companies will also feel the drive. Goal of the union is a quarter-million new members by 1953.

First company scheduled for the organizing attempt is Detroit-Michigan Stove Co., operating two plants in Detroit and employing in the neighborhood of 1000. Emil Mazey, UAW secretary-treasurer, declared, "The benefits and protection of a union contract are going to be brought to

the Detroit-Michigan stove workers . . . We intend to guarantee that workers who choose to join the union are fully protected in the exercise of their legal rights to job security, wholesome working conditions and all the other benefits of collective bargaining."

D-Day was on Wednesday, and Detroit's police commissioner was asked to furnish protection against violence.

Simultaneous with the announcement of the organizing drive, the UAW disclosed it has filed unfair labor practice charges with NLRB against the company. These stated . . . "From 1935, the date of the passage of the Wagner Act, down to the date of this charge, the Detroit-Michigan Stove Co. has illegally interfered with and defeated all attempts to organize a labor union among its employees by the hiring of strike-breaking services and the services of gangsters to beat up, coerce and intimidate its employees who were seeking to join a union."

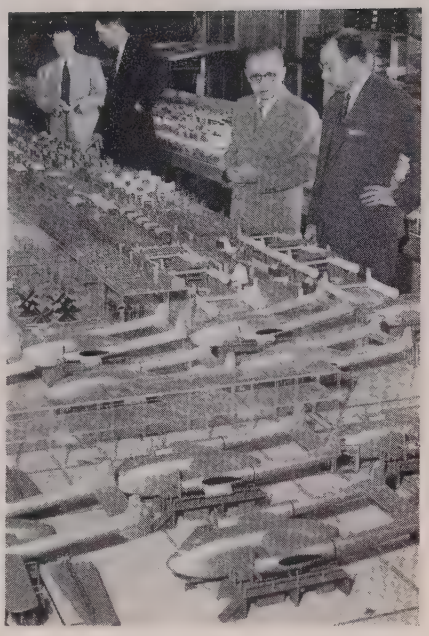
Other Labor Pots Boil

Sporadic labor disturbances at automotive plants temporarily take a slice off passenger car production. Briggs Mfg. Co. has been in an almost constant turmoil with four wildcat strikes in an eight-day period. Banks of components are virtually nonexistent and such work stoppages are reflected immediately in consumer plants. Packard took the brunt of the Briggs' Connor Plant walkout, with Plymouth also affected. Ford is also having labor difficulties, its Rouge union local charging a speed-up. Trouble at the sprawling Rouge has been confined so far to just words.

Few of the work stoppages have resulted in overall decrease in car production, however, except on an individual week's basis. When work resumes, assemblies are increased through overtime to get the production schedule into gear with materials receipts. Basically this is the key to today's level of car production. There is a good chance, however, that before the new 65 per cent steel allotment goes into effect July 1, production cuts will be more the result of lagging car sales than of materials lack. None of the car makers wants to admit that his models are not moving as fast as he would like. But nearly all breathed a sigh of relief when the government gave the go-ahead on changes in design of 1952s.

K-F Resumes Production

Kaiser-Frazer has resumed output at Willow Run after a two-week closing and is aiming at a 400-a-day assembly rate, the same as that prevailing before the shut-down. This should have given its dealers a chance to work down some of the inventory they had of Kaisers and Henry Js.



KEY TO CONVERSION: Progress in converting Kaiser-Frazer Corp.'s vast Willow Run plant to manufacture Fairchild C-119 cargo planes is checked on this 35 x 70-foot scale model. Edgar Kaiser, K-F president, right, inspects layout techniques that have cut conversion planning time to a third of normal. Other K-F executives, left to right, are: Harvey Smith, aircraft works manager; John Hallett, vice president and general manager; and John Tacke, operations manager

K-F's deal with Fisher Body in which Willow Run's efficient press shop will be kept occupied for at least three months turning out an average of 5000 tons of body panels a month for the latter represented a stroke of genius by both companies. Just at the time when K-F had finally made long-term commitments for sheets at regular mill prices reduction in car scheduling became advisable, leaving the company on the spot as to what it would do about the steel. Fisher Body's problem was the opposite, not enough sheets in sight for its projected schedule. The resulting three-month initial contract is a happy solution for both.

Hudson Sales Lag

Another company now troubled by slow sales and materials problems is Hudson. Blame for the sales decline was placed by A. E. Barit, president, primarily on the Federal Reserve Board's credit restrictions, and on heavy advance buying last fall. Future production, however, would in large measure be determined by the materials situation, he stated. The company shut down on Tuesday for a two-week period "to adjust inventories, to balance with demand." Ten thousand employees were laid off.

Defense Progress Report

Reports are appearing from car manufacturers on progress made toward defense production. Among these is the announcement that Packard began construction of its turbo-jet engine plant adjoining its proving grounds near Utica, Mich. A 700,000-square foot building will be required to house the J-47 engine's assembly. A new car service parts warehouse containing 415,000 square feet is also being built, completion scheduled for September. It will supplement Packard's local facilities and will add to the space available for defense assignments.

Pontiac is hurrying the construction of two new buildings with a total floor space of more than a million square feet. The smaller of these, to house manufacture of medium-caliber cannon, is scheduled for completion this fall. Ground has now been broken on the 620,900-square foot plant which will be used in production of the "Otter," a new-type amphibious cargo carrier. Early 1952 is the target date set by the GM division for occupancy of this plant. Work on an Army rocket contract is to be centered in a refurnished Pontiac building, formerly used for storage.

Don't Believe All You Read

Note to defense plant officials: Don't always believe the tags on equipment which has been in government storage. Millwrights in one Detroit-area plant which is installing a large press took the tag which said "5 tons" on one section at its face value and tried to move it with a five-ton crane. When the cables snapped and the piece dropped back to the floor they discovered the actual weight to be about 30 tons.

Diesels in the Traffic

Diesel trucks are expected to have the roads pretty much to themselves in the heavy-duty field, according to H. B. Ford, of GMC's Truck & Coach Division. Shift toward this form of motive power is continuing this year, he told the Northern California section of SAE last week. In 1938, he pointed out, diesel truck sales totaled 489 units. In 1946, 2000 of them were sold. Last year their sales soared to 12,669 units.

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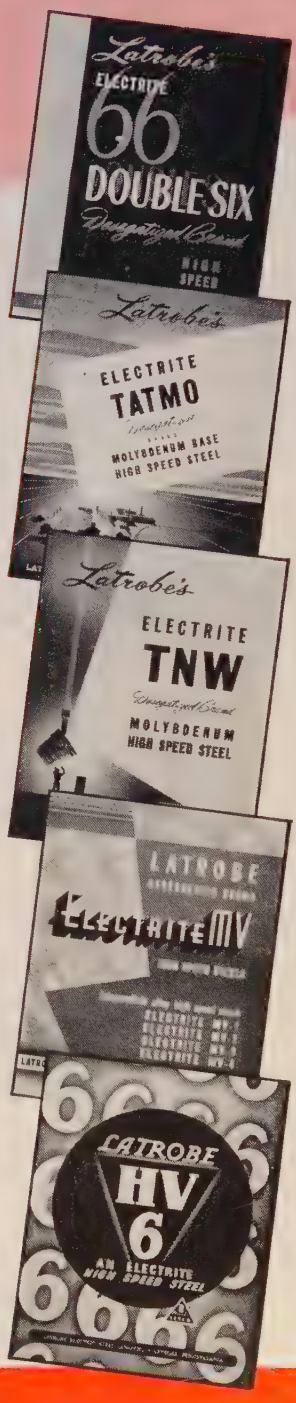

The foremost problem facing the metalworking industry today stems from the critical shortages that exist in many raw materials.

Sudden shifts from the use of old and familiar to relatively new and unfamiliar materials are sometimes necessary, therefore, to overcome these shortages and still meet the demands created by expanding production trends.

To assist the possible new—and the old—users of its Desegatized Brand molybdenum high speed steels—Electrite Double-Six, Electrite Tatmo, Electrite TNW, Electrite MV Series, and Electrite HV-6—the Latrobe Electric Steel Company has carefully compiled guides to their proper selection and use. These guides, in the form of pamphlets illustrated at the right, are complete and contain up-to-date information on the analyses, forging, hardening, tempering, testing, recommended uses and the available forms of each of these steels. Get in touch with your nearest Latrobe representative for copies or write direct to the main office in Latrobe, Pennsylvania.

And remember . . . . Latrobe's Desegatized Brand molybdenum high speed steels are fully uniform and free from harmful carbide segregates. This quality—found in all Desegatized Brand steels—guarantees greater tool and die efficiency—an important factor in your production program today!

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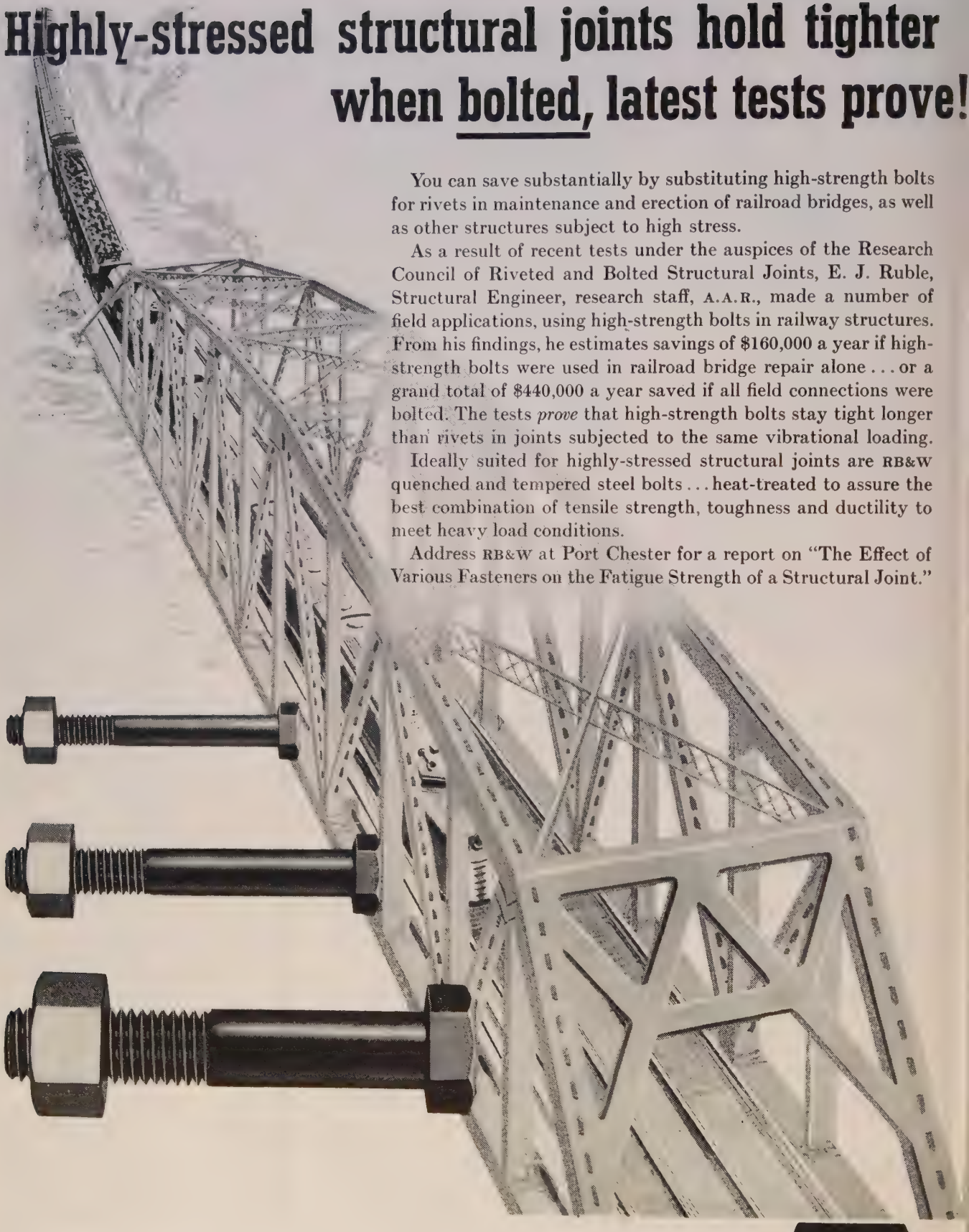

You can save substantially by substituting high-strength bolts for rivets in maintenance and erection of railroad bridges, as well as other structures subject to high stress.

As a result of recent tests under the auspices of the Research Council of Riveted and Bolted Structural Joints, E. J. Ruble, Structural Engineer, research staff, A.A.R., made a number of field applications, using high-strength bolts in railway structures. From his findings, he estimates savings of $160,000 a year if high-strength bolts were used in railroad bridge repair alone . . . or a grand total of $440,000 a year saved if all field connections were bolted. The tests *prove* that high-strength bolts stay tight longer than rivets in joints subjected to the same vibrational loading.

Ideally suited for highly-stressed structural joints are RB&W quenched and tempered steel bolts . . . heat-treated to assure the best combination of tensile strength, toughness and ductility to meet heavy load conditions.

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106 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Impetus of surprisingly high auto assemblies and above-capacity steel output keeps the production ball rolling and the industrial activity index on a lofty plane

PULSE of industry continues steady and strong despite all the current difficulties besetting businessmen. Of the four components of STEEL's industrial production index, only the automobile industry has the millstone of government restrictions around its neck. Yet auto output is still relatively high. Smooth sailing continues in steel production, electric power output and freight car loadings. This steadiness of industrial production is reflected in STEEL's index which for the 14th consecutive week remained above the 215 mark. In the week ended May 19 the index was at 219 per cent of the 1936-1939 average, as against 218 for the prior week and 205 in the comparative week of 1950.

Good Year for Autos?

Hurdling the materials barriers in fine form, the automotive industry finds its year's production may be the second-best in history. *Ward's Automotive Reports* estimates that on the basis of current schedules and second-half limitations, the 1951 total could outstrip all but 1950's remarkable record. Despite minor labor disturbances and conversion difficulties, production in the week ended May 19 in the United States and Canada represented the third straight week of increase. A total of 160,467 cars and trucks was estimated to be turned out, compared to the prior week's figure of 158,502. Output in the like week of 1950 was 175,314. Actually, materials problems are taking a week-to-week toll in production, *Ward's* states. U. S. assemblies are dropping steadily behind the pace of a year ago. So far in 1951 passenger car production is approximately 11 per cent ahead of this time last year, whereas on Apr. 1 prior to materials cutbacks, the margin was 19 per cent.

Steel Nears May Record . . .

Basic metals industries, responding to the advanced defense requirements timetable, continue their unprecedented tonnage avalanche. The steel industry, maintaining its pace over rated capacity, will surely hang up a new monthly output record in May. Schedules for the week ended May 26 called for production of 2,071,000 net tons of ingots and steel for castings, 6000 tons less than the previous week's total. A year ago 1,940,000 tons were supplied by steel mills.

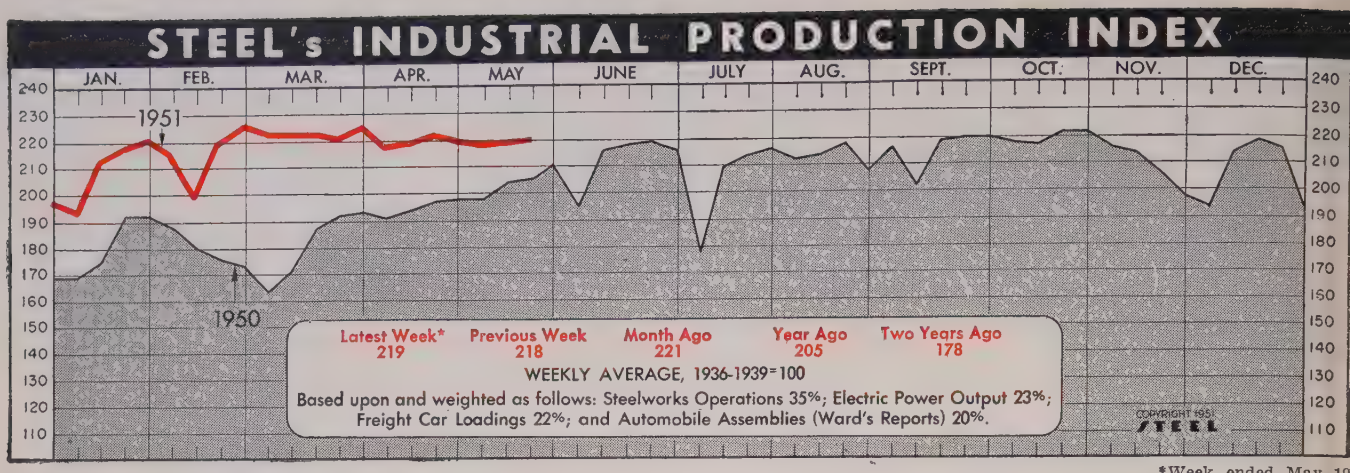
In sustaining the high rate of steel production 28,368,680 gross tons of iron ore were consumed in the first four months of 1951, says the Lake Superior Iron Ore Association. This figure is 3,159,993 tons ahead of the like 1950 period. April consumption declined slightly from the previous longer month to 7,235,243 gross tons, but this total bettered the 7,139,859 tons used in April, 1950.

Building Awards Plummet . . .

The props were knocked out from under the construction awards in the week ended May 17, when engineering contracts sank to $152 million, 88 per cent below the average week to date this year. The figures, says *Engineering News-Record,* are made up of four days' reports rather than the

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	104.0	104.0	103.0	101.0
	Electric Power Distributed (million kilowatt hours)	6,559	6,567	6,730	5,845
	Bituminous Coal Production (daily av.—1000 tons)	1,603	1,618	1,662	1,602
	Petroleum Production (daily av.—1000 bbl.)	6,177	6,167	6,144	5,117
	Construction Volume (ENR—Unit $1,000,000)	$151.8	$294.8	$220.8	$206.0
	Automobile and Truck Output (Ward's—number units)	160,467	158,502	166,502	175,314
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	810†	808	810	743
	Business Failures (Dun & Bradstreet, number)	171	181	151	199
	Currency in Circulation (in millions of dollars)‡	$27,287	$27,315	$27,157	$26,980
	Department Store Sales (changes from like wk. a yr. ago)‡	+3%	+8%	+13%	−2%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,507	$14,717	$16,664	$13,817
	Federal Gross Debt (billions)	$254.7	$254.5	$254.7	$256.0
	Bond Volume, NYSE (millions)	$15.0	$14.9	$16.0	$21.7
	Stocks Sales, NYSE (thousands of shares)	8,577	9,090	7,820	9,752
	Loans and Investments (billions)†	$69.4	$70.1	$69.7	$66.4
	United States Gov't. Obligations Held (millions)†	$30,339	$30,836	$30,713	$35,899
	†Member banks, Federal Reserve System.				
PRICES	STEEL'S Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL'S Nonferrous Metal Price Index‡	241.6	242.3	243.4	172.7
	All Commodities†	182.2	182.8	183.1	156.1
	Metals and Metal Products†	189.5	189.6	189.6	169.5
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				



*Week ended May 19

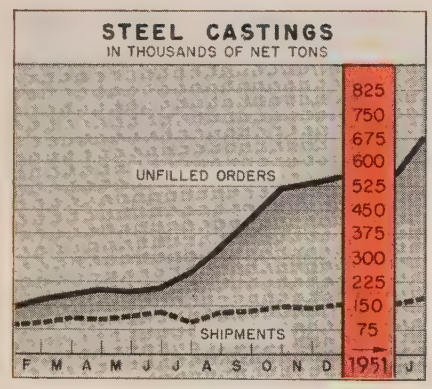
usual five. Under contract for the 20 weeks of 1951 is $5715 million, 39 per cent above the same period last year. Although housebuilding activity is beginning to lag behind last year's record volume, industrial, military and public construction are still on the upgrade. More workers are employed in contract construction these days. April totals reached nearly 2.5 million, 375,000 more than a year ago.

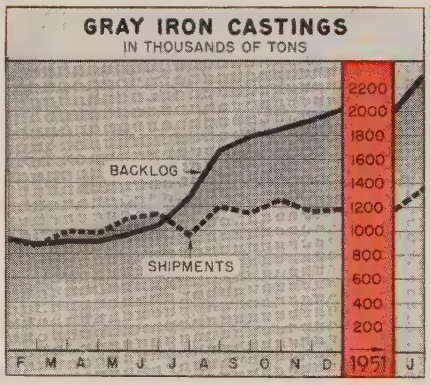
Employment Declines . . .

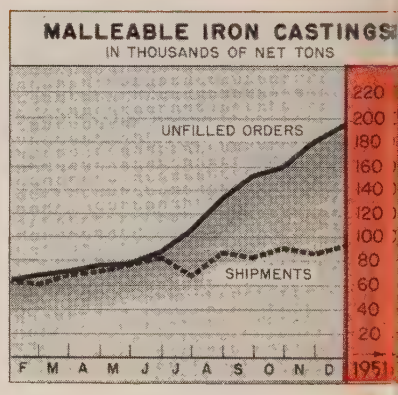
An employment reaction to defense conversion and limitations on consumer durables occurred in metal-working plants between mid-March and mid-April, says the Labor Department. The monthly drop of 40,000 was caused mainly by auto plant layoffs. This contrasts with an average monthly employment gain of over 100,000 between June, 1950, and March, 1951, in plants producing primary metals and metal products. In mid-April 7.2 million people worked in these plants. Machinery industries gained about 250,000 of the 900,000 new workers employed since the start of the Korean war. Other major increases were reported in the transportation equipment industry—primarily in aircraft plants—and in electrical machinery manufacturing. The overall employment situation is strong, with unemployment and layoff rates in early April at the lowest level for the month in the postwar period.

Price Drop Continues . . .

Wholesale prices continue to decline but few analysts predict the trend will continue for long. Bureau of Labor Statistics reports that average primary market prices dropped to 182.2 per cent of the 1926 average in the week ended May 15. The all-commodity index has skidded 1.2 points since May 1 and stands at the lowest level since January. Frac-







Steel Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	174.1	89.1	675.4	142.5
Feb.	....	91.8	....	165.2
Mar.	....	111.8	....	185.6
Apr.	....	107.0	....	201.6
May	....	117.9	....	198.0
June	....	131.1	....	206.8
July	....	98.3	....	255.4
Aug.	....	128.4	....	239.9
Sept.	....	134.6	....	428.0
Oct.	....	149.6	....	521.8
Nov.	....	145.9	....	537.7
Dec.	....	155.3	....	554.2

* For sale. U. S. Bureau of the Census.

Gray Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Backlogs* 1951	Backlogs* 1950
Jan.	1,364	913	2,298	914
Feb.	....	864	....	873
Mar.	....	996	....	922
Apr.	....	981	....	922
May	....	1,095	....	978
June	....	1,136	....	1,040
July	....	961	....	1,287
Aug.	....	1,202	....	1,670
Sept.	....	1,159	....	1,794
Oct.	....	1,255	....	1,840
Nov.	....	1,161	....	1,930
Dec.	....	1,182	....	2,012
Total	....	12,905		

*For Sale. U. S. Bureau of the Census.

Malleable Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	92.5	62.9	234	62
Feb.	...	60.4	...	67
Mar.	...	66.3	...	70
Apr.	...	69.8	...	76
May	...	76.2	...	77
June	...	82.3	...	87
July	...	67.5	...	105
Aug.	...	86.0	...	132
Sept.	...	82.5	...	153
Oct.	...	90.0	...	160
Nov.	...	85.2	...	180
Dec.	...	91.5	...	195
Total	...	920.6	...	...

* For sale. U. S. Bureau of the Census

tional declines occurred in tin and metal products, textiles and some chemicals, while foods and farm products caused the major part of the drop. Most industrial prices have been sticking close to ceilings because of the scarcity of basic materials. The Economic Stablization Agency thinks prices may continue soft for the next 60 to 90 days.

Commercial Fatalities Low . . .

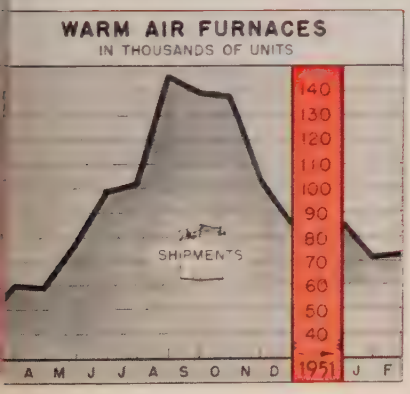
Indication of the nation's business vitality: Only 34 out of every 10,000 businesses in the country in 1950 failed to make the grade. Two out of every three of these commercial failures occurred in the first five years of the company's existence. These facts were pointed out by Dun & Bradstreet Inc. in tracing expansion of business throughout the country by analyzing commercial and industrial failure trends since 1900. The study—"Survival Qualities of American Business"—shows that the 50-year failure average is only 0.78 per cent of the number of firms in business. Although the failure rate has been on a gradual upswing since 1946, it is still substantially below the pre-war rate. Manufacturing failures in 1950 made up 2,074 of the country's 9,162 failures. Iron and steel concerns accounted for 71 failures, and machinery makers for 209. This compares with 1940 figures of 116 and 117, respectively.

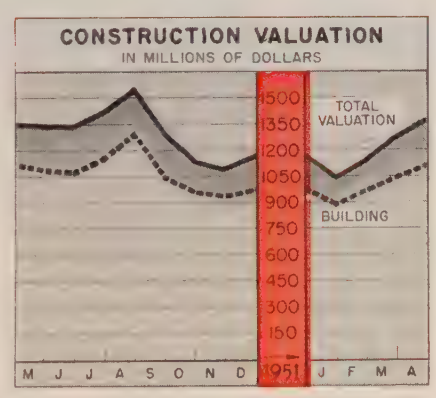
Trends Fore and Aft . . .

Production of goods and services zoomed to an annual rate of $314 billion in April, $42 billion above the mark at the start of the Korean war and $14 billion higher than 1950's last quarter . . . April shipments of machine tools were 155.7 per cent of the 1945-1947 average. Of this total, 13.6 per cent went to foreign countries . . . The government employs some 400,000 more civilians than last June . . . Seasonal promotions during the first half of May helped lift retail trade above April's level. Reversing the pattern of the past two years, shoppers spent a smaller share of their income on hard goods they did a year earlier.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Durable Goods.....May7	Indus. Production..May21	Ranges, Gas Apr.30
Employ., Metalwkg..May21	Ironers May14	Refrigerators May14
Employ., Steel Apr.9	Machine Tools May7	Steel Forgings Apr.30
Fab. Struc. Steel...May7	Prices May14	Steel Shipments May21
Foundry Equip. ...May21	Pumps, New Orders..May14	Vacuum Cleaners ..Apr.30
Freight Cars Apr.23	Purchasing Power..Apr.23	Wages, Metalwkg...Apr.16
Furnaces, Indus. ...May21	Radio, TV Apr.23	Washers May14
Gear Sales May7	Ranges, Elec. May7	Water Heaters ....Apr. 30





Warm Air Furnaces
Shipments in Units

	1951	1950	1949
Jan.	71,143	39,887	31,734
Feb.	71,966	45,618	33,011
Mar.	.....	59,982	41,271
Apr.	.....	58,798	34,471
May	.....	78,349	42,406
June	.....	98,517	55,916
July	.....	102,189	48,575
Aug.	.....	145,512	85,320
Sept.	.....	139,014	112,264
Oct.	.....	137,915	103,401
Nov.	.....	102,001	79,280
Dec.	.....	85,407	52,323
Total ...	.....	1,093,189	719,972

U. S. Bureau of the Census

Construction Valuation
(37 States)—In Millions of Dollars

	Total		Building	
	1951	1950	1951	1950
Jan.	1,043.2	730.9	881.9	578.8
Feb.	1,140.5	779.5	962.3	627.0
Mar.	1,267.4	1,300.2	1,043.8	1,075.3
Apr.	1,375.0	1,350.5	1,108.9	1,123.5
May	.....	1,347.6	.....	1,083.0
June	.....	1,345.5	.....	1,072.0
July	.....	1,420.0	.....	1,162.2
Aug.	.....	1,548.9	.....	1,295.1
Sept.	.....	1,286.5	.....	1,048.3
Oct.	.....	1,135.8	.....	956.7
Nov.	.....	1,087.1	.....	931.6
Dec.	.....	1,169.4	.....	969.0
Total	.....	14,501.1	.....	11,922.5

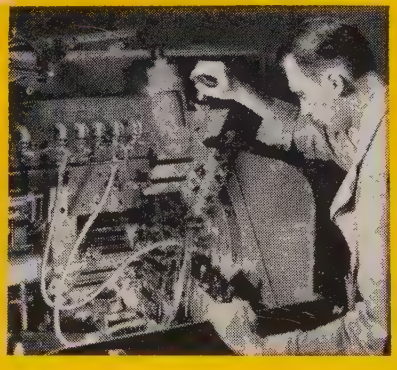
F. W. Dodge Corp.

SUN DEVELOPS 4 NEW CUTTING OILS

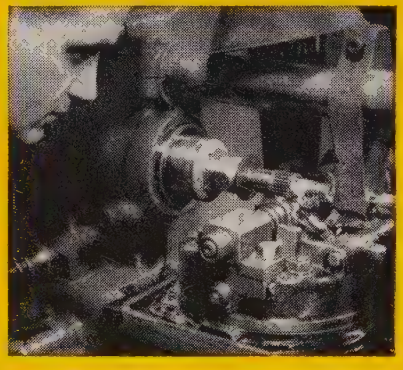
For Better Finishes, Higher Production, Tool Life Never Before Possible

Sun's continuous program of cutting oil research has discovered ways to make four well-known Sunicut grades even better. Their number designations remain the same, but the components and formulations are new. The results they'll give on your machines will be little short of amazing. Contact the nearest Sun Office today. A representative will gladly arrange a trial order.

SUNICUT 11. Dual-purpose oil for automatics machining nonferrous metals, free machining steels. Won't stain brass, copper.



SUNICUT 102. Active-sulphur, general-purpose oil for use in automatics working all types of steel, especially high-alloy steels.



SUNICUT 105. Transparent sulphurized cutting oil for heavy-duty jobs like gear cutting, broaching, and threading alloy steels.

SUNICUT 209. Du
purpose oil for larger au
matics working steel, bra
copper. Also hydraulic f
id for chucking machin

MAIN DISTRICT OFFICES

CONNECTICUT
Bridgeport
Hartford

DISTRICT OF COLUMBIA
Washington

FLORIDA
Jacksonville
Miami
Tampa

ILLINOIS
Chicago

INDIANA
Fort Wayne
Indianapolis

MAINE
Portland

MARYLAND
Baltimore

MASSACHUSETTS
Boston
Lawrence
Revere
Worcester

MICHIGAN
Detroit
Flint
Grand Rapids
Jackson

NEW JERSEY
Atlantic City
Hackensack
Newark
South Amboy
Trenton

NEW YORK
Albany
Binghamton
Buffalo
Long Island City
Newburgh
New York City
Peekskill
Rochester
Syracuse

OHIO
Akron
Cincinnati
Cleveland
Columbus
Dayton
Toledo
Youngstown

PENNSYLVANIA
Allentown
Beaver
Blawnox
Brownsville
Erie
Exeter
Harrisburg
Johnstown
Philadelphia
Pittsburgh
Reading
Williamsport

RHODE ISLAND
Providence

TEXAS
Dallas

WEST VIRGINIA
Huntington
Wheeling

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®

Men of Industry

W. J. STEPHENS
. . . an asst. gen. mgr.-sales at Bethlehem

W. M. MAYBERRY
. . . mgr. tin mill sales, Bethlehem

Bethlehem Steel Co., Bethlehem, Pa., appointed **W. J. Stephens** as an assistant general manager of sales, and **W. M. Mayberry,** manager of sales, tin mill products.

A. P. Miller, formerly general superintendent of the Indiana Harbor Works of Inland Steel Co., was elected vice president in charge of operations for **Newport Steel Corp.,** Newport, Ky.

B. A. Chapman, since 1946 assistant to the vice president-manufacturing, was appointed production manager of **Nash-Kelvinator Corp.,** Detroit.

Edgcomb Steel Co., Philadelphia, elected **William H. Franklin** executive vice president, **Oren H. Persons** and **Carl S. Vogel,** vice presidents, and **H. Lloyd Beyer Jr.,** a director.

Boyd S. Oberlink was elected a vice president of **Allis-Chalmers Mfg. Co.,** Milwaukee. **W. A. Yost** was placed in charge of a new mechanical power department in the general machinery division, and **J. F. Roberts** was made director of engineering and **R. C. Allen,** consulting engineer of the division.

W. H. Hughes Jr. joined **Bowen Products Corp.,** Auburn, N. Y., as assistant treasurer and controller. He formerly was with Climax Molybdenum Co.

T. I. Phillips, vice president of **Westinghouse Electric Corp.,** Pittsburgh, and formerly in charge of its East Pittsburgh divisions, was assigned to the staff of industrial products vice president, **John K. Hodnette,** to help plan and carry out the company's industrial products expansion program. **L. B. McCully** was named general manager, East Pittsburgh divisions, in addition to his present duties as manager of the transportation and generator division. **Thomas R. Lawson** was appointed assistant sales manager, industrial products. **Robert E. Ferry** was named manager of apparatus sales offices in Wheeling and Fairmont, W. Va.

George G. Herrick joined the sales staff of **Clearing Machine Corp.,** Chicago press manufacturer. Working from Philadelphia headquarters he will represent Clearing in the New York and New England territory.

Promotions at **Steelcraft Mfg. Co.,** Rossmoyne, O., include: **Maurice Schulzinger,** chief engineer, elected vice president in charge of engineering; **Nat Lehman,** sales manager of steel building product division, named vice president in charge of sales promotion and advertising; and **William Skillman,** comptroller, elected assistant treasurer.

J. W. Lipphardt was appointed supervisor of quality control for **Wheeling Steel Corp.'s** Yorkville, O., Works, to succeed **Gordon S. Coleman,** now assistant general manager of the plant.

John R. Wanamaker was elected to the board of directors of **Henry Disston & Sons Inc.,** Philadelphia.

R. Ruzicka was appointed manager of installation and service, **R. K. LeBlond Machine Tool Co.,** Cincinnati. He continues as assistant sales manager.

Frank L. Johnson was appointed manager of export sales, engine division, **National Supply Co.,** with headquarters in New York.

National Lead Co., New York, appointed **Paul W. Allen** plant manager of its MacIntyre development, where titanium-bearing ilmenite is mined and milled. **Robert A. Putney** was made plant manager of the Perth Amboy plant, **Nicholas S. Muccilli** becomes superintendent of the metal division there, and **Howland B. Hammond** is superintendent of the pigment division.

Herbert B. Clark was elected a director, **Fansteel Metallurgical Corp.,** North Chicago, Ill.

T. L. Richards was appointed sales manager for the industrial balancing

MAURICE SCHULZINGER
. . . Steelcraft V. P.-engineering

NAT LEHMAN
. . . Steelcraft V. P.-sales & adv.

division, **Bear Mfg. Co.,** Rock Island, Ill.

Glen A. Wilson was appointed general superintendent, carbide division, **Firth Sterling Steel & Carbide**

GLEN A. WILSON
. . . div. gen. supt. at Firth Sterling

Corp., McKeesport, Pa. He has been chief industrial engineer. Before joining Firth Sterling in 1949 as industrial engineer, he was plant industrial engineer at Reynolds Alloy Co.

John Fox, formerly district manager, Machinery & Welder Corp., was named representative of **A. O. Smith Corp.'s** welding products division in greater St. Louis area.

Patrick Dolan was named district manager of the newly established Baltimore office of **Patterson Foundry & Machine Co.**

Frank L. Brierly was appointed eastern division sales manager, **Townsend Co.,** New Brighton, Pa. His headquarters will be in the Philadelphia office. **Edward T. Brown** was appointed special representative, Pittsburgh district.

William W. Fisher Jr. was appointed general manager, instrument division, **Daystrom Inc.,** Elizabeth, N. J. He was general manager, Bendix Aviation Corp.'s Pioneer-Central division, Davenport, Iowa.

Changes in the management of **Fisher Body** plants, General Motors Corp., Detroit, include: **Marvin J. Olson,** manager, Baltimore assembly plant, transferred to Hamilton, O., as manager, fabricating plant to replace **S. J. Sabourin,** who will manage the Grand Blanc tank plant at Grand Blanc, Mich. **Leo L. Rosshirt,** manager, Atlanta assembly plant, is transferred to Baltimore in a similar capacity, and is replaced by **Paul E. Garin. Henry B. Lowendick,** manager, Janesville, Wis., assembly plant, moves to Detroit as manager, Fisher Body Fleetwood plant which produces bodies for Cadillac. He succeeds **Martin W. Legant,** retired. **Vernon L. Conner** becomes manager at Janesville, and is replaced as assistant manager, Fisher Body assembly and fabricating plants at Pontiac, Mich., by **J. Merle Darling.**

Leslie G. Hulbert was appointed manager, market development division, **United States Steel Supply Co.,** Chicago, subsidiary, U. S. Steel Corp.

Cro-Plate Co. Inc., Hartford, Conn., appointed **Clarke W. Clemmer Jr.** as eastern division equipment engineer.

C. S. Thayer was named manager of the Northwest operations of **Aluminum Co. of America.** Currently serving as manager of the smelting and fabricating operations at Vancouver,

C. S. THAYER
. . . manages Alcoa's Northwest operations

Wash., Mr. Thayer will also manage the new aluminum smelting plant to be built at Wenatchee, Wash. He continues headquarters at the Vancouver Works.

Richard M. Davis was elected a director of **Atlas Steels Ltd.,** Welland, Ont., Canada.

Emmett D. Quan was named manager of works, passenger car shops, **Pullman-Standard Car Mfg. Co.,** Chicago.

G. O. Noville was appointed materials representative for **Kaiser Frazer Corp.,** Willow Run, Mich., in the Pacific Coast area. He will assist the K-F purchasing department in contract relations with Coast vendors.

Jack B. Weil was appointed to the newly created position of director of public relations and advertising for **Christiansen Corp.,** Chicago, and its three subsidiary companies, Alumicast Corp., Magnesium Co. of America, and Bates Expanded Steel Corp.

Hunt-Spiller Mfg. Corp., Boston, appointed **Franklin I. Fickett** sales engineer in Indiana, Ohio and Michigan.

John Meade joined the administrative staff of **Fansteel Metallurgical Corp.,** North Chicago, Ill., as director of industrial relations.

Donald N. Watkins, president and treasurer, **Laclede-Christy Co.,** Pittsburgh, was elected chairman of the board and president. **Roy Erikson** was elected treasurer, **Edward Williams,** comptroller and secretary.

R. A. Gloss was appointed sales representative for **Federated Metals Division,** American Smelting & Refining Co. He will cover Wisconsin and upper peninsula of Michigan, with headquarters in Milwaukee.

Midvale Co. appointed **Joseph E. Busko** as director of safety of its Philadelphia plant.

Hays Corp., Michigan City, Ind., appointed **John R. Heming** project engineer for combustion control.

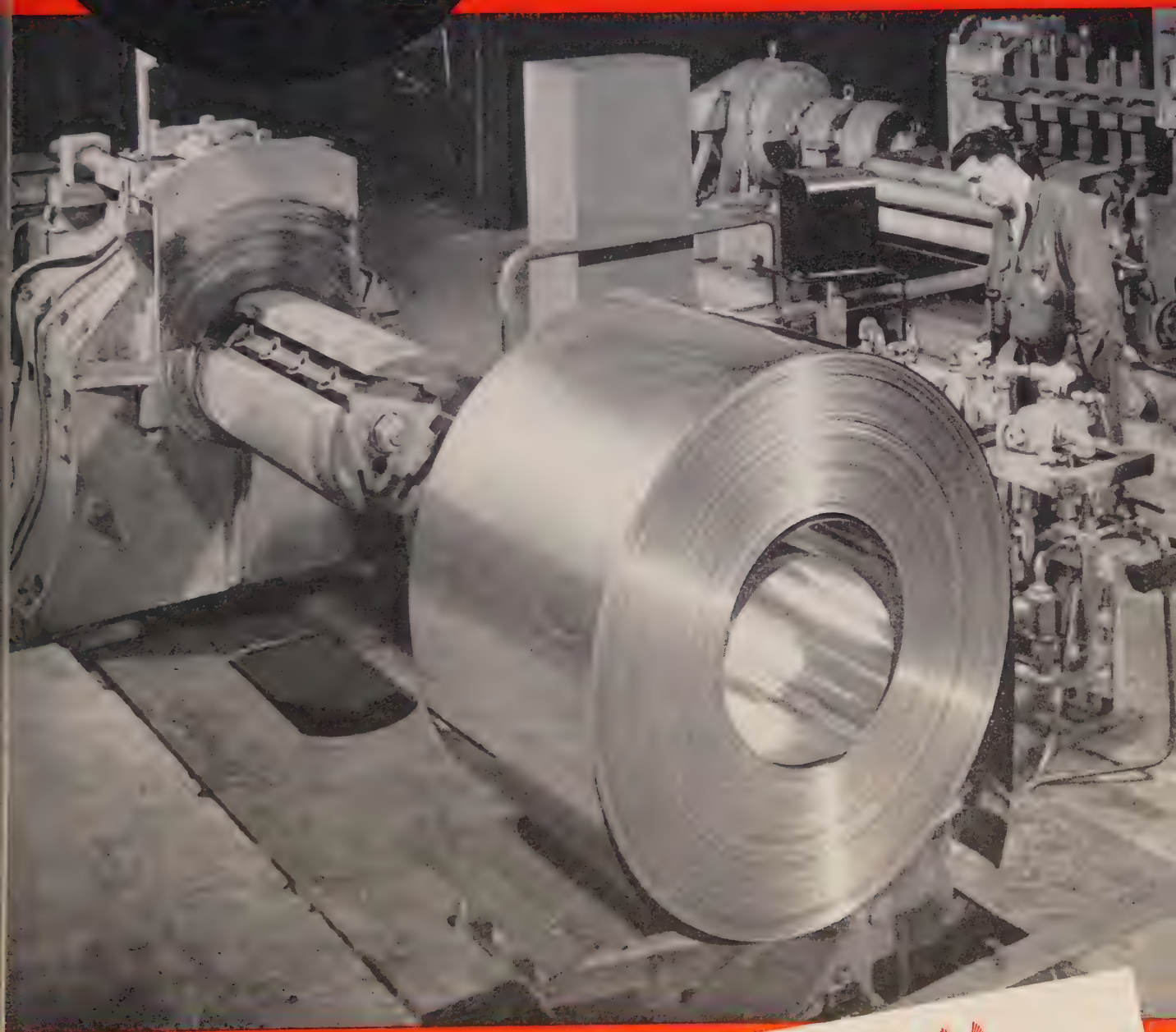
Benjamin A. Smith, vice president and secretary, C. O. Bartlett & Snow Co., Cleveland, was elected president of the **Cleveland Engineering Society.**

Leo F. Hunderup was appointed vice president and assistant general manager of **Greenfield Tap & Die Corp.,** Greenfield, Mass. He was executive vice president for many years of Van Norman Co. and its subsidiary, Morse Twist Drill & Machine Co. He will

LEO F. HUNDERUP
. . . Greenfield Tap & Die V. P.

WEAN PAY-OFF AND WINDING REELS

are designed to handle the largest coil weights made today



SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

THE WEAN ENGINEERING CO., INC.
WARREN, OHIO

ALVIN R. KUDER
. . . OPW Corp. V. P.-manufacturing

EDGAR H. CUMMINGS
. . . chief engineer of Round Associate

CHARLES J. HARDY JR.
. . . ACF pres. and chairman-exec. com.

assist **H. L. Bill** in management of the company's plants in Greenfield and the Geometric Tool Co. division in New Haven, Conn.

Alvin R. Kuder was elected vice president in charge of manufacturing, **OPW Corp.,** Cincinnati. Associated with the corporation since 1930 in various positions, he most recently served as works manager.

George G. Raymond Jr. was named executive vice president and general sales manager of **Lyon-Raymond Corp.,** Greene, N. Y., material handling equipment manufacturer. **Christian D. Gibson** was promoted to vice president in charge of engineering. **William H. Lamb** becomes treasurer, and **Carl F. Kellogg,** advertising manager.

Chas. Taylor Sons Co., Cincinnati, appointed **Addison Maupin** development engineer to specialize in application of its refractory products in the iron and steel industries. He will have temporary headquarters in the Cleveland district offices, 3091 Mayfield Rd.

R. C. Hoff was promoted to director of engineering and manufacturing, **Eriez Mfg. Co.,** Erie, Pa.

Edgar H. Cummings was appointed chief engineer of **Round Associate Chain Cos.,** Cleveland. He was formerly assistant chief engineer, American Monorail Co.

A. J. Steffens Jr. will cover North and South Carolina, eastern Georgia, and Florida as sales engineer for **Osborn Mfg. Co.,** Cleveland.

Ziegler Steel Service Co., Los Angeles, appointed **Norton Bock** sales agent. He will serve the Arizona territory.

James F. Sweatt, manager, tire plant, Oaks, Pa., **B. F. Goodrich Co.,** was named manager of the Los Angeles tire plant to succeed **Laurence R. Keltner,** who becomes employee relations director with headquarters in Akron.

V. C. Story was appointed Chicago regional manager of **Lamson Corp.,** Syracuse, N. Y.

Warren A. Lacke was appointed general manager of industrial relations, **Continental Can Co.,** New York. He assumes the duties of **J. E. Niederhauser,** formerly vice president in charge of industrial relations, who has retired.

Following resignation of **Charles J. Hardy Sr.** as director, chairman of the board and a member of the executive committee of **American Car & Foundry Co.,** New York, **John E. Rovensky** was elected chairman of the board, and **Charles J. Hardy Jr.** as chairman of the executive committee. Mr. Hardy combines that office with his present position as president. **Robert H. R. Loughborough** was elected a director.

The following purchasing department appointments are announced by **United States Steel Co.,** Pittsburgh. Chemicals, ferroalloys and oils, **J. E. Hanly,** purchasing agent; construction materials and services, **R. J. MacKenzie,** purchasing agent, **R. D. Crowley,** assistant purchasing agent; iron and steel scrap, **R. F. Dyson,** purchasing agent; electrical and mechanical equipment, **R. M. Brown,** purchasing agent, **W. W. Crawford** and **B. D. McMillen,** assistant purchasing agents; mill supplies, **J. A. Wrieth,** purchasing agent, **A. E. DeWall** and **S. A. Witt,** assistant purchasing agents; nonferrous metals, **A. Siragusa,** purchasing agent; office equipment and supplies, **R. Muirhead,** purchasing agent; and raw materials, **E. R. Sherrick,** manager, and **J. S. Hess,** assistant manager.

OBITUARIES . . .

Dilwyn S. Stevenson, purchasing agent for **United States Pipe & Foundry Co.,** Burlington, N. J., died May 16 after a brief illness.

William M. Powell, 58, president, **Diamond Mfg. Co.,** Wyoming, Pa., died May 14. He also was secretary-treasurer of the Power Engineering Corp., Wilkes-Barre, Pa., and president of the National Association of Perforated Metal Manufacturers.

James M. Barton, plant manager, **New Departure Division,** Bristol, Conn., General Motors Corp., died May 15.

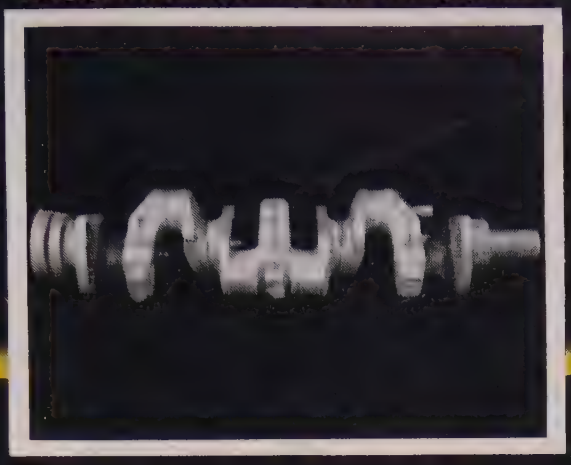
Henry F. Jabel, 46, assistant to the vice president, **American Can Co.,** New York, died May 20. He had been with the company 29 years.

Samuel McCutchen, 47, sales manager in Chicago for **Titeflex Metal Tubing Co.,** Newark, N. J., died May 19.

Lee S. Blosser, supervisor of production planning at the **Harrison Radiator Division,** Lockport, N. Y., General Motors Corp., died May 17.

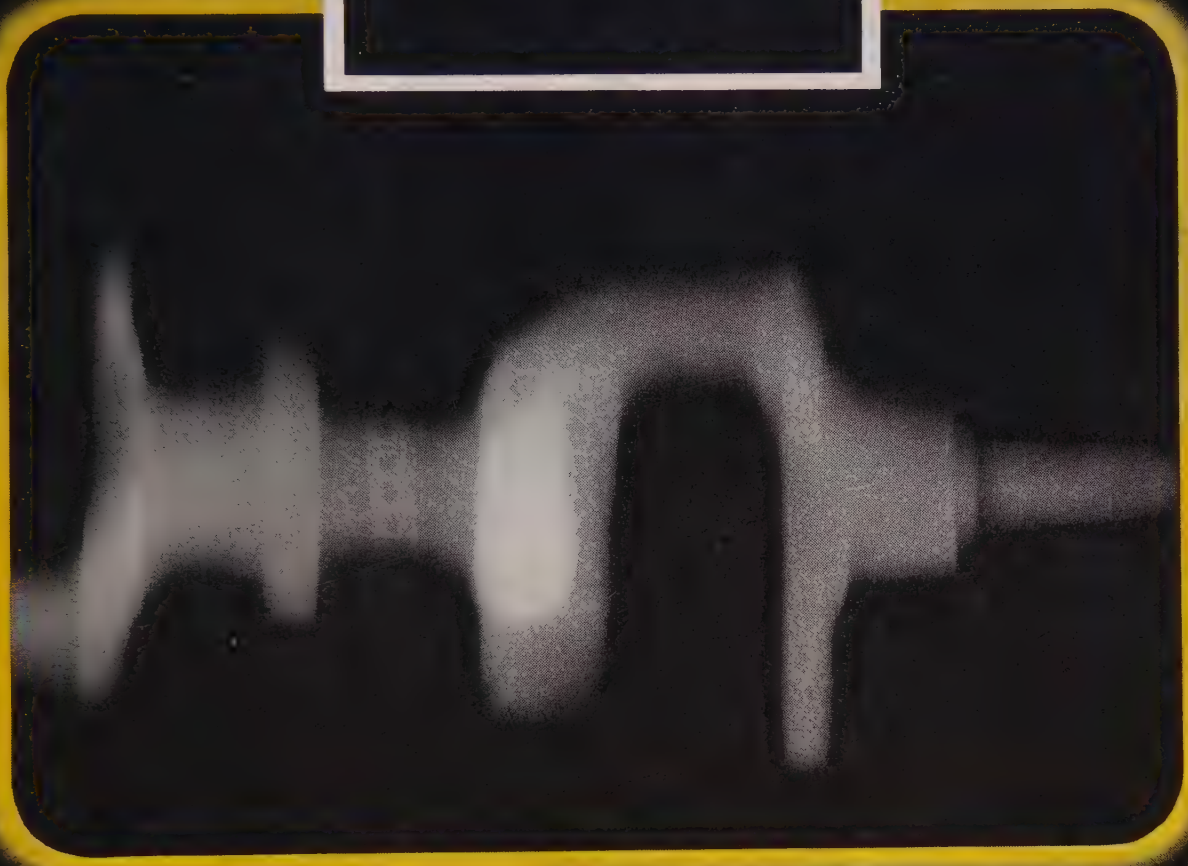
Harold L. Stevens, superintendent of **American Bridge Co.,** Elmira Heights, N. Y., died May 17.

Photograph of automotive crankshaft shown in radiograph below.



WILL IT STAND THE GAFF?

IS IT WORTH MACHINING TIME?



Radiography provides the answers

THERE'S a lot more at stake in a crankshaft than mere pounds of steel. Should it let go, the reputation of the foundry can go with it. Costly machining time can be wasted . . . and great inconvenience caused by a breakdown in service.

Best assurance against failure comes through radiography. With it you can check internal conditions with no damage to the part—make sure that no serious hidden flaw exists.

Radiography has become a regular part of many foundries' routine. It forestalls releasing imperfect castings—helps build reputations for consistently good work. It frequently shows how casting operations can be improved to provide higher yields in production runs.

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Production and Engineering
NEWS AT A GLANCE

POWDER IS GOOD LUBRICANT—Molybdenum disulphide is a powder material about which much more is going to be heard. Over the past three years intensive research into its properties as a solid-film lubricant and fretting corrosion inhibitor has been under way at the laboratories of both the National Advisory Committee for Aeronautics and Bureau of Standards. This gravitated into its trial in hot-pressed bearing materials and more recently in combination with metallic powders for pressed and sintered blades of turbine wheels in turbojet engines. Excerpts from seven technical papers on molybdenum disulphide, two of them British, have been wrapped up in booklet form by a leading producer of the compound.

NEVER SATISFIED— Rail shipping caustic soda requires rubber-lined steel tank cars because the chemical must be kept free from any traces of iron. It costs chemical suppliers $1000 each to line these cars and they would welcome a new and reasonably priced material for tanks which would eliminate the need for rubber interiors. Any suggestions?

PUTTING SQUEEZE ON PIPE—Improvement in tensile strength specifically and overall quality in general of large-diameter welded steel pipe is accomplished by cold working the completed sections. Compression sizing by machine is the procedure with pipe up to 20-inch; over that hydraulic expansion to a degree of 2 per cent on the diameter does the trick. —p. 78

GAGES AID CARBIDE TOOLING—Two interconnected gages, capable of being mounted on any standard machine tool, provide a method for maintaining a given surface speed by means of a voltage generated in direct proportion to the spindle speed and modified through an electrical system to indicate the required spindle speed in terms of diameter of the workpiece. They are aimed to help in changing machine settings for carbide tooling. . . —p. 85

FIRESAFE PAINT NEARER— Titanium may lend a hand in reducing the hazards of shipboard fires at sea. Du Pont pigment research experts have taken titanium chloride, a liquid, converted it to a titanium ester by reacting with isopropyl alcohol, then using this as a vehicle to carry aluminum flake. After application, the ester breaks down in combination with moisture to release propyl alcohol and leave titanium oxide and aluminum, a coating which did not burn even when test panels were brought to a dull red heat of 1300 °F. Only troubles are getting the material to adhere properly and to attain resistance to salt water attack.

CHROME PLATE OVER ZINC—Acceptable chrome plating of steel stampings or zinc die castings, without intermediate copper or nickel plate, is claimed feasible by first electroplating 0.003-inch of zinc on the cleaned surface, with a brightener added to the cyanide bath, then rinsing, following with a bright dip to provide a chromate film on the zinc plate which permits deposition of the decorative chrome without attack on the zinc itself. Processing in chrome bath is conventional, except that it is advisable to boost the chrome concentration from around 32 ounces to 53 ounces.

KNOW-HOW FOR WELDERS— One of the first departments to be set up in a new plant destined for some form of aircraft or ordnance production is a welding school. Demand for trained welders usually outruns the supply available from private trade schools and public vocational schools, so in-plant training programs often are inevitable. Depending upon the degree of skill needed, such courses will run from 20 to 400 hours. —p. 82

UNCONVENTIONAL TOOLS—Milling cutters with 34-degree positive rake angle represent a sharp break with tradition and are showing performance in terms of speeds and feeds that in many cases is little short of spectacular. However, tool engineers are going slow in making any all-out recommendations until more operating data are available. High angle cutters require workpieces which are homogeneous, clean and scale-free. On one job of milling chasers, a fivefold increase in cutter life was realized. —p. 76

MIGHTY MAGNET MITES— Cobalt - platinum magnets in small size, say like that of a pencil eraser, prove to have about 24 times the lifting power of an equivalent size magnet of Alnico-5 and about eight times higher resistance to demagnetization (coercive force). The alloy can be drawn into thin sheets or wire, and is easily machined in comparison with the aluminum-nickel-cobalt combination. Early work on it was done by German scientists in 1935, with General Electric research teams adding further touches since. Commercial use will be limited, both by restrictions on the use of cobalt and by the prohibitive cost of the large amount of platinum required. *A.H.A.*

Metalworking Outlook—p. 39 *Market Outlook—p. 117*

Redesign Boosts Productio

Radical changes in shape of milling cutter teeth permit sensational increases in speed and tool life on certain varieties of work

High angle high speed steel cutter combines rapid metal removal with long life between grinds, milling dovetails in tangential die chasers

SHORTAGES of vital materials used in high production metal-cutting tools now are focusing attention on possibilities for stepping up the cutting speed of tools which require minimum amounts of scarce alloying elements. For several years metallurgists, tool engineers and production men have been conducting practical experiments aimed to get more out of high speed steel cutters—milling cutters in particular.

Results attained by a number of companies—including Greenfield Tap & Die Corp., Threadwell Tap & Die Co., Jones & Lamson Machine Co., James Hunter Machine Co., Union Twist Drill Co., Rice Barton Corp., Brown & Sharpe Mfg. Co. and Allis-Chalmers Mfg. Co.—prove conclusively that under certain conditions high speed steel milling cutters can be made to turn out production approaching even that of tungsten carbide cutters.

Three-Front Attack — Attack on the problem of stepping up performance of high speed steel milling cutters is being pressed along three fronts. Metallurgists—particularly those employed by steelmakers and cutting tool manufacturers—are experimenting with modifications in selection and amount of components, and with new methods of heat treatment. They are seeking to cut down percentages of scarce alloying elements and at the same time to increase the stamina and to prolong the life of tools.

Tool engineers—notably those with progressive tool-using companies—have been experimenting with cutters having teeth ground to unconventional shapes. Many such cutters already are operating on production work with highly encouraging results. The unconventional shapes just mentioned apply particularly to unusually steep positive rake angles and to steep helix angles. Rake angle is that measured between the front face of a tooth and a radius touching its cutting edge. Helix angle is that measured between the center line or axis of a cutter and the cutting edge of a tooth as viewed sighting squarely at the cutter periphery.

Research men with cutter manufacturers have been attacking the milling problem along the line of stepping up the performance of standard stock cutters, not only through metallurgical refinements but also through more effective mounting and driving of the cutters and more efficient clamping, feeding and unclamping of workpieces in milling machines. In these projects they are showing results which challenge the ingenuity of the machine tool industry and milling machine chuck and vise manufacturers.

It looks very much like it is now up to some of the machine tool builders to extend the ranges of their speeds and feeds and to minimize or eliminate the steps in these speed and feed ranges. It also looks to be squarely up to the chuck and vise manufacturers to promote power-operated automatic holding devices which will locate, grip and release workpieces instantly, at the same time holding them securely without marring or distortion during the milling phases of the production cycle.

High Angle Milling Cutters—These same forward-looking cutter manufacturers most certainly are not unmindful of the rising tide of interest in the so-called "high angle" milling cutters. Their research men are working on them and have their practical development well under way. As a matter of fact, they could stock these cutters right now, but they are proceeding cautiously on merchandising them for fear that users now expect them to be "miracle tools"—typical of the industrial cure-alls which we are altogether too prone to expect in these days of highly publicized revolutionary developments.

When correctly used they do have valuable—but at the same time definitely limited — possibilities. Present danger as far as the cutter manufacturers are concerned is that users whose expectations have been unduly built up, will apply these high angle cutters to "impossible" jobs, thus ruining cutters and work—and possibly damaging their machines. They will turn around and heap undeserved blame on the cutter manufacturers. As soon as users become better informed, this danger will diminish. Then, undoubtedly, high angle cutters will become stock items.

34-Degree Average — Geometry and production performance of various types of high angle, high speed steel milling cutters are being studied closely at Jones & Lamson Machine Co., Springfield, Vt. The designs are the result of painstaking, step-by-step experimentation with various positive rake angles and helix angles operating on various materials at widd

vith High Speed Steel Cutters

By GUY HUBBARD
Machine Tool Editor, STEEL

Like prospectors who finally dig up treasure in their own backyards, tool engineers are just getting around to discovering hitherto unrealized metal-removing ability in ordinary high speed steels

ranges of speeds and feeds. As a result of the experiments, rake angles in the order of 30 degrees—34 degrees being the average—have been arrived at. This results in a hooked type of tooth which on narrow cutters resembles those used on curled chip circular metal saws. Helix angles of the high angle teeth range from 14 degrees on slotting cutters with staggered teeth, to 45 degrees on various other types of cutters.

Thus far most of the high angle cutters used by Jones & Lamson have been reground from worn out high speed steel cutters originally of conventional design. This work has been done by a tool salvage company. It is a tribute to the "tool engineering tradition-busting" of Walden Sinawski, the J. & L. tool designer, that when his drawings orignally were submitted, the tool salvage company returned them with this comment: "These drawings must be incorrect; no tool engineer ever specified cutters to any such angular dimensions as these."

While the Jones & Lamson tool engineers have not attempted to delve deeply into the metallurgy of these cutters, they have discovered that those created from what originally were hammered blanks—gear shaving cutters for example—outperform those created from what originally were blanks cut from bars of high speed steel. Their conclusion is that hammer forging tends to refine the physical structure of the steel.

As far as metallurgy of workpieces is concerned, they definitely have found that these high angle cutters operate successfully only on homogeneous, scale-free and grit-free metals such as premachined carbon steels and alloy steels, including high speed steel. The same cutters fail rapidly on cast iron and "dirty" steels.

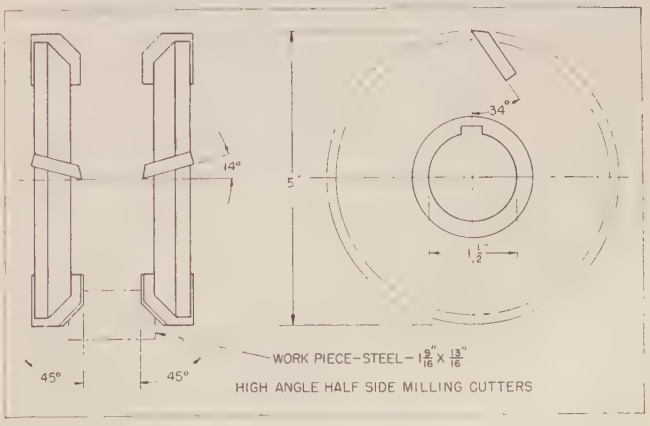
1000 Chasers per Grind—The 6-inch diameter, 34-degree rake angle, 10-degree helix angle cutter shown in the accompanying photograph, was developed by Jones & Lamson to mill sharp cornered dovetails in tangential chasers of threading dies. "Climb milling" these high speed steel chasers of 30 per cent machinability at about 120 revolutions per minute and 20 inches per minute feed—which translates into surface speed of 187 surface feet per minute and chip load of 0.005-inch per tooth—cutter life averages 1000 chasers (two 2½-inch long cuts per chaser) per grind. With standard cutters operating at ordinary speeds and feeds the average is only 200 chasers per grind. A 50-50 mixture of sulphur base and straight mineral oil is used as coolant.

High angle cutters also are being applied to production slab milling in the Jones & Lamson shop. Speeds ranging from 180 surface feet per minute on high speed steel to 425 on low carbon steels have been attained with high angle cutters made of ordinary high speed steel.

With similar cutters made of so-called "super-high speed steel" successful runs have been made at speeds as high as 560 surface feet per minute and chip loads as high as 0.017-inch per tooth. These slabbing cutters have rake angles ranging from 30 to 34 degrees and helix angles of around 35 degrees. On slotting and forming, 34-degree cutters with 10 to 14 degree helix angles handle chip loads up to 0.008-inch per tooth. Typical of such cutters are the matched pair of half side milling cutters with inserted high speed steel teeth of which a sketch appears below.

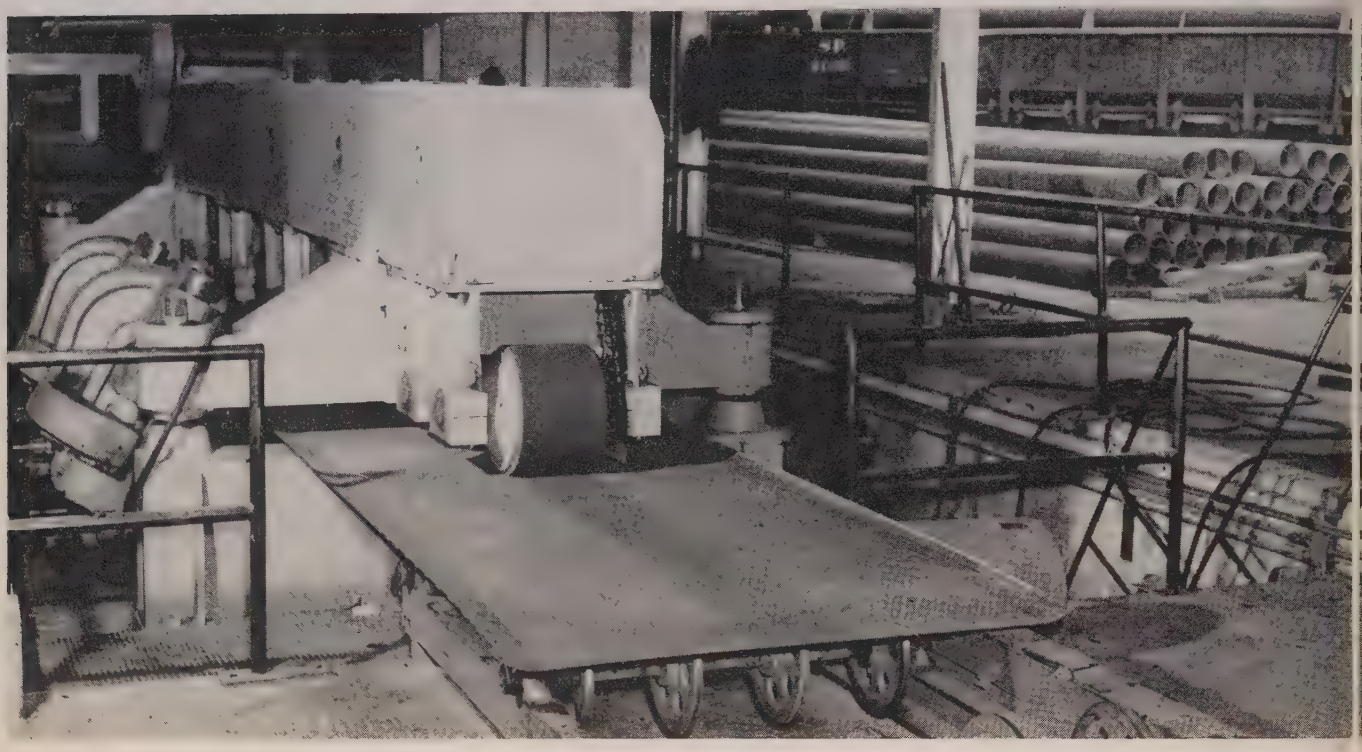
Results of high rake milling at Jones & Lamson Machine Co. are matched by those at Greenfield Tap & Die Corp. There climb milling of flutes of ½-inch carbon and high speed steel taps is done with 30 degree rake, 10 degree helix, profile cutters. At 320 surface feet per minute, 55 inches per minute feed and 0.006-inch chip load per tooth, these cutters mill 350 to 500 flutes per grind.

Fast straddle milling of steel blocks is accomplished by mating cutters whose inserted high speed steel teeth are set at 34 degree rake



20 Miles of Pipe per Day

Lost motion and machine downtime are cut to a minimum at a new California plant which can convert daily 1000 tons of plate into 20 to 36-inch steel line pipe



In Basalt Rock Co.'s pipe plant at Napa, Calif., this plate has been pickled and now is leaving the preforming machine which rolls the edges to radius of the finished pipe

TWENTY MILES or more of 20 to 36-inch steel line pipe can be fabricated daily from about 1000 tons of steel plates at the new Napa, Calif., plant of Basalt Rock Co. Relative ease with which the company turns out the large-diameter pipe is the result of sound engineering involving the complete integration of conveyors and other materials handling devices in the production lines.

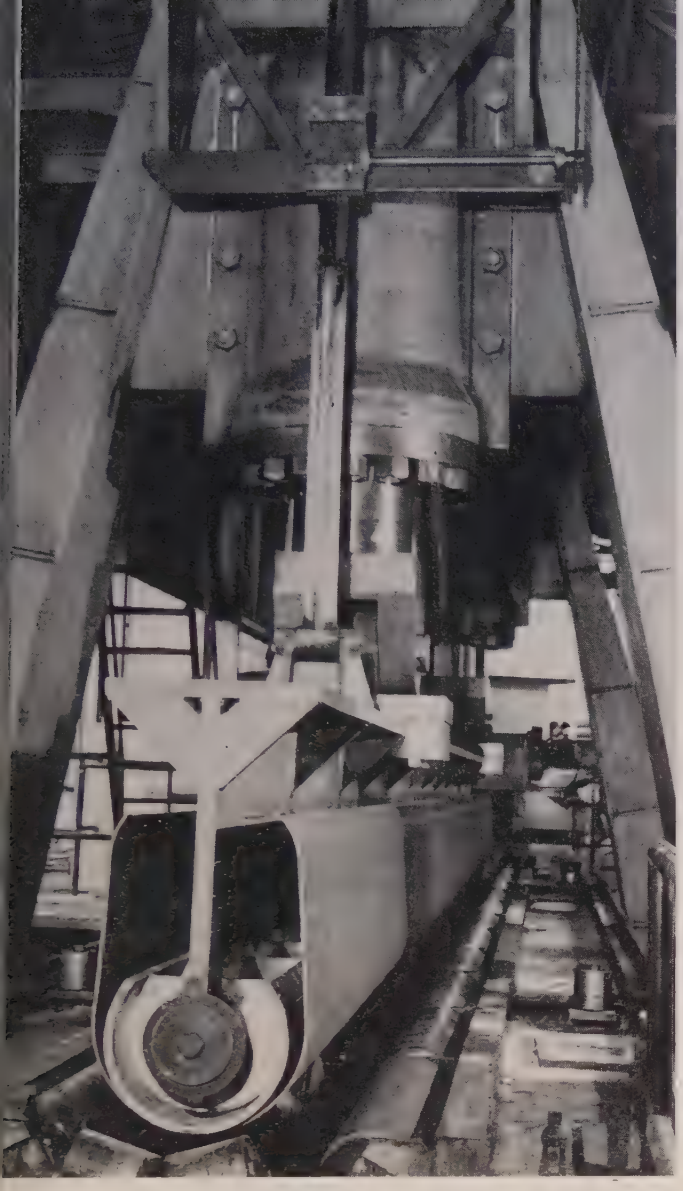
Current operations are based on an arrangement between Henry Kaiser and A. G. Streblow, Basalt's energetic founder, whereby Kaiser ships plates to Basalt for conversion into pipe which Kaiser sells. Actually, a large part of the steel Kaiser ships some 500 miles northward from the Fontana mill, 48 miles east of Los Angeles, subsequently is shipped as pipe back through Fontana on its way to midcontinent customers. Shipments of a typical size, 26-inch, run about 56 cars a day.

Two Lines—The plant layout comprises a line for forming the plates into cylindrical sections serving two separate fabricating lines. The first line, completed in 1949, handles sizes from 8⅝ to 20 inches, and the second line for sizes from 22 to 36 inches inclusive, went into operation last year.

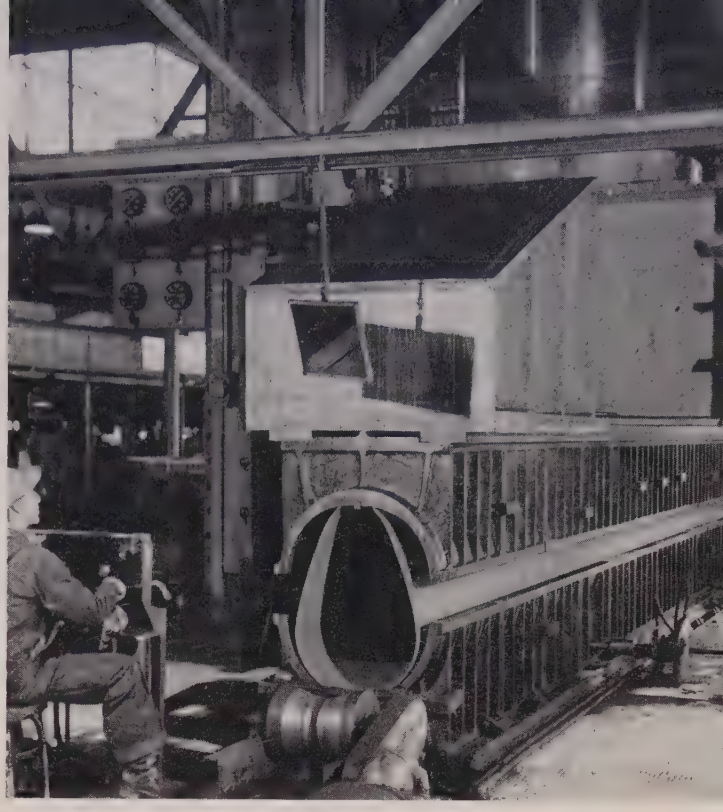
Incoming plates are stored in piles and subsequently segregated into spaced packs in cradles which are lifted by crane into a 186° F acid bath and held for 20 minutes. After rinsing and drying, the plates are cut to the exact circumferential size desired on a rotary shear, and the edges are beveled for welding. The plates then pass through a series of rolls which preform the outer edges to the radius of the finished pipe.

Next, the plate is automatically conveyed to a U-ing press fitted with a pair of hydraulic cylinders which actuate a ball-type ram. During the downward stroke of the two pistons a pair of lower bolsters comes in to wrap the plate around the ram.

As the plate moves on to the rounding or die press, the upper edges are sprayed with oil to reduce wear. The U-shaped section rolls into position and is held in line by a spacer in the upper half of the die, assuring a straight weld. This spacer can be adjusted from ½ to 2 inches in the 40-foot long press, depending upon the diameter of pipe being formed. Several

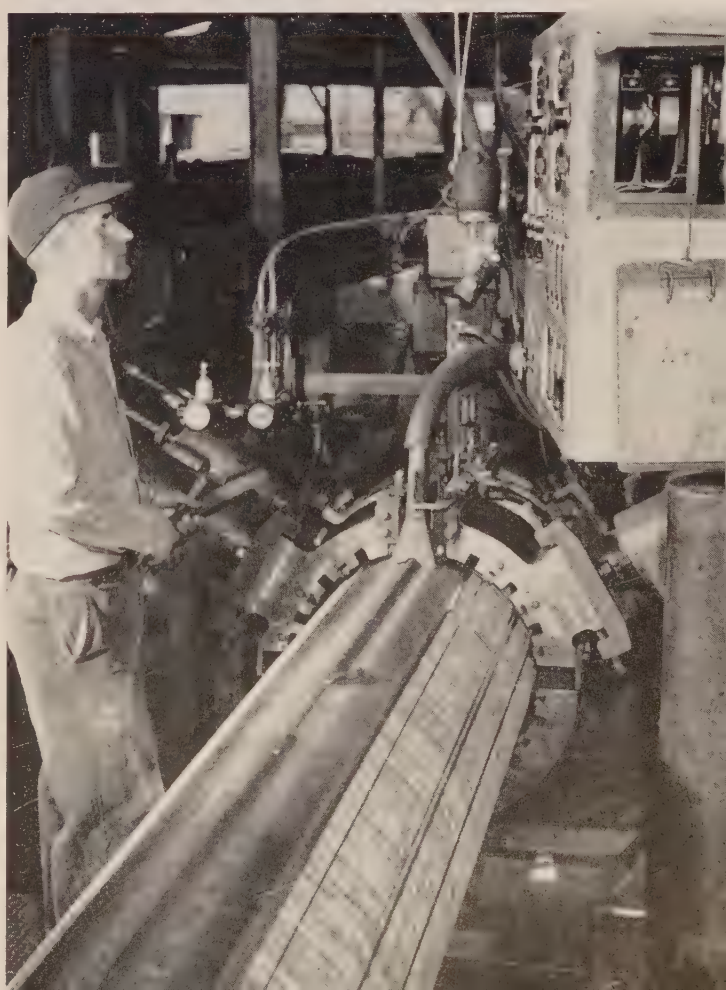


This double cylinder press forms the plate into a "U". Bolsters below floor level wrap plate around the ball-type ram as downward stroke is completed



Above—Pipe section from the U-ing press will be rounded in this press as soon as dies close. Key or spacer which runs entire length of upper die holds plate edges in alignment and assures a straight weld

Below—Formed pipe sections up to 20 inches OD are automatically welded at 5 to 6 feet per minute with this Berkeley continuous machine equipped with two-wire submerged arc welding heads

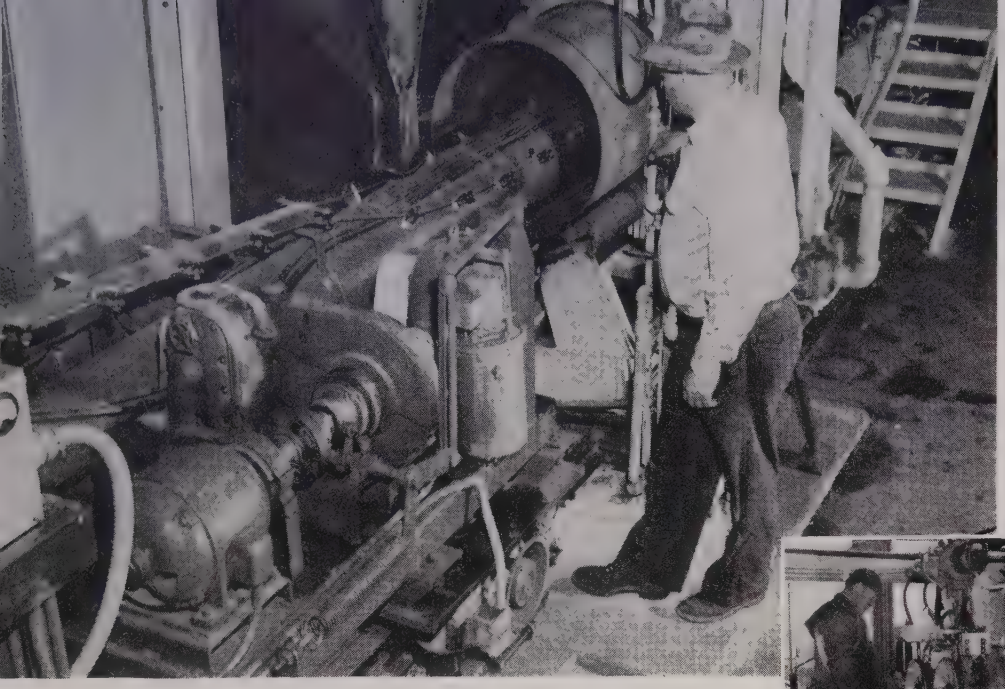


sets of dies are required to accommodate the various sizes of pipe, but these dies are segmented and may be changed in an hour or so. Actually, the press is not one but two, each with 20 foot sections synchronized hydraulically.

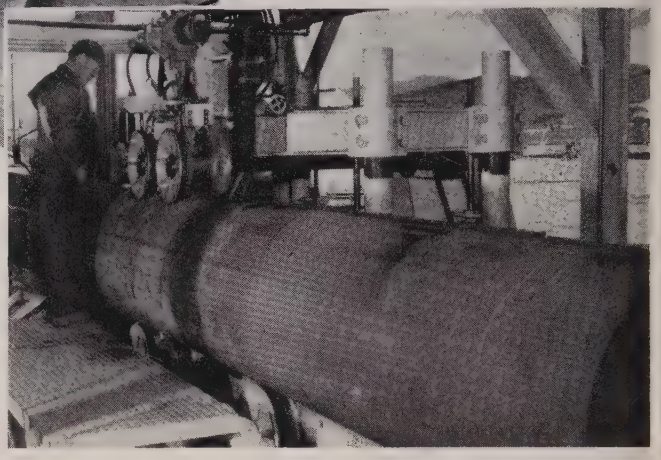
After degreasing, the sections up to 20 inches go to a battery of three Berkeley continuous welders and a fourth machine designed by Basalt. The three Berkeley machines are fitted with Lincoln submerged arc welding heads, while the fourth machine has a Westinghouse head. Lincoln L-60 welding wire is fed to the machine from reels on the floor above. Motor-generator sets and welding flux recovery units also are located in the same area. Recovered flux is fed back to the welders in the ratio of one part to two parts new material.

5 Feet per Minute—Pipe flows from the welding machines in an unending stream at the rate of 5 to 6 feet per minute to an inspection table where end sections are marked for cropping.

Tensile strength is increased 12 per cent and yield



Left—Pipe sections 22 inches OD and over are welded inside with this machine with automatic welding head on boom. Carriage with variable speed drive supports boom, motor-generator set and flux recovery system



Below—After inside weld is completed, pipe is drawn through this stationary fixture to perform the outside weld. Pipe then is stretched in a hydraulic expander to improve physical properties, end-milled and beveled for welding in the field

strength 20 per cent through cold working by passing the pipe through a sizing and straightening machine which shrinks it 1 to 2 per cent. This greatly improves the quality of the pipe.

After end facing and beveling the two ends of the pipe sections simultaneously, they are tested hydrostatically and given a final visual inspection. While under full pressure the pipe is subjected automatically to repeated hammer blows as a further check for flaws.

Sequence of Operations—A new building houses the line for fabricating pipe in diameters from 22 to 36 inches. Fabricating procedures are fundamentally the same as for smaller diameters, but actually there are many radical departures. The steps in sequence are these:

1. Tack welding. This is done at 12 points along the seam while the pipe section is held rigidly in a fixture.

2. End facing. A slight cut is taken off the ends of the pipe to eliminate any slight deviations in alignment.

3. Hot alkaline cleaning. Handling into and out of the cleaning solution is conveyorized and automatic.

4. Attaching steel tab at end of seam to be welded. Welds are started on this pad, assuring a good joint in the pipe itself.

5. Inside welding. This an unusual setup. The pipe is clamped into position in a fixture, and a two-wire welding head, mounted on a cylindrical boom and positioned accurately over the seam, traverses the pipe from end to end as it makes the weld. The boom, as well as the generator set and flux recovery system is mounted on a carriage. This carriage is driven on rails at 4 to 5 fpm by a Link-Belt variable speed drive. Basalt has six identical machines for inside welding.

6. Outside welding. The pipe is drawn through a stationary welding fixture, also equipped with a two-wire automatic welding head. A gas flame preheats the seam as the pipe passes through the fixture to further assure a sound weld. Outside welding is faster—at 6 to 7 fpm—so only four machines are needed to keep up with the six inside welders.

7. Removing tabs by torch.

8. Inside cleaning. Pipe is up-ended by a hydraulic lifting device and dirt removed by downward blast of air.

9. Cold working. Larger diameters are cold-worked by expansion rather than by compression as in the case of 20-inch and smaller pipe. The pipe drops into a hydraulic expander fitted with gates holding inserted dies of exactly the desired diameter of the finished pipe. The gates then are opened and the pipes subjected a pressure equal to at least 85 per cent of the specified tensile strength. At the same time, automatic hammers jar the pipe to detect flaws. In expanding the diameter about 2 per cent, the pipe shortens 4 to 5 inches. The pipe, incidentally, can be filled in less than 1 minute.

10. End-facing and beveling preparatory to girth welding in the field. Double end lathes which will take up to 40 foot lengths machine both ends simultaneously.

11. Final inspection. This is done visually, the inspector checking internal flaws by riding through the pipe on a small dolly.

The engineering staff has found innumerable applications for hydraulics. Even the bottom dies of the rounding press are fitted with rollers, raised hydraulically, so that the incoming piece can push the section just formed out of the way and on to the next operation.

By GUY HUBBARD
Machine Tool Editor

Seen and Heard in The Machinery Field

TRAVELING HEAD MACHINES: Now that there are material and economic incentives to get more production per pound of machine tool and per square foot of floor space, there is a rising tide of interest in machines of so-called "traveling head" type. This is true particularly in the field of large machines, where savings in weight and floor space are most obvious.

Throughout the history of the machine tool industry there has existed a strong undercurrent of prejudice against large machines which operate by traversing the tools past the work rather than by traversing the work past the tools. Although this always has been the basic method of operation in that basic machine tool, the lathe, it never has been accepted as the conventional method for planing, milling or grinding of big work. Nevertheless, successful plate planers always have operated on that principle, as also have roll grinders and some special varieties of milling machines.

The main advantage of a traveling head machine, dimension-wise, is that its bed need be only slightly longer than its work length capacity. On the other hand, a typical machine of work traversing type—a conventional planer for example—must have a bed at least twice the length of its platen or work table in order to preclude dangerous overhang at maximum stroke. Secondary advantage is that in many cases the weight of the traveling head is far less than combined weights of table and workpiece—which tends to make the traveling head machine the more agile of the two types.

Whatever the original design and constructional drawbacks may have been, improved engineering techniques—including drives—and improved methods of construction undoubtedly have eliminated many of these oldtime handicaps. This is indicated by the fact that certain companies which at one time built only work traversing grinders, now build traveling head types as well.

CONSERVING OUR ALLOYS: At this time when shortages of alloying elements, and control of scarce materials by the government, are really beginning to be felt by cutting tool manufacturers, some tool engineers are beginning to apply carbide techniques to high speed steel applications.

Scarcity and high cost of carbide cutting materials—as well as practical difficulties in fabricating and machining large masses of those materials—always have dictated that small amounts should be made to serve wherever possible. This has led to almost universal use of so-called "carbide tipped" cutters on which only the vital cutting areas are made of the scarce and costly carbides.

Aside from bits used in lathe, planer and boring tools and the relatively heavy inserted teeth used in large milling cutters, applications of high speed steel have for many years run to its more prodigal use in the form of solid high speed drills, reamers, counterbores, small and medium size milling cutters, etc. While such solid tools have certain advantages in the way of stability and the number of regrinds of which they are capable (assuming that they are not broken in the meantime), they certainly do represent prodigal use of tool material now that such material definitely is on the critical list.

It looks as though this state of affairs now will boost the use of various types of inserted tooth cutters—in which high speed steel teeth are replaceably anchored into bodies of ordinary steel. It also looks as though there will be a rising tide of interest in cutters with cast iron or steel bodies, to which "wafers" of high speed steel are permanently brazed or otherwise bonded on the cutting faces and edges.

DELIVERING THE COOLANT: Since that distant day when some rustic genious improved scythe grinding by hanging a punctured can so that it dripped water on his foot-power grindstone, efficient delivery of coolant to the working point has been one of the big metalworking problems.

Many systems have been tried, ranging all the way from squirting from nozzles at high pressure to flooding on the liquid at low pressure. Fundamental weakness always has been that coolant gets all over everything except that vital area where it is most needed—which is the place where tool and metal meet. Many things conspire to exclude it from there, including centrifugal force of spinning work, revolving tools or grinding wheels, accumulations of chips, and the very high temperatures which the coolant is supposed to counteract.

High speed operation has accentuated the problem. However, ingenuity of machine tool designers and coolant specialists is meeting the challenge in various ways. One new method is deliberately to atomize the cutting oil or coolant and get it to the cutting area in the form of mist which penetrates right to the heart of the operation. This mist then is picked up by a suction system and returned to the reservoir where it again assumes liquid form—ready for recirculation. This system has proved successful on carbide tool grinders using diamond wheels. It holds possibilities for thread grinding and various other operations.

Another interesting system is that which delivers coolant to the cutting area through pores of the grinding wheel—thus putting centrifugal force to work instead of trying to work against it. This is a patented feature on a well-known line of surface grinders, whose maker claims that the flow of coolant also cleans the wheel while cooling the work.

Still another line of attack is through composition of coolants. These range all the way from viscous compositions which cling to work and tools, to thin liquids which have unusual wetting properties combined with ability to make the metal which is cut allergic to cutting metals—thereby preventing chips from building up on edges and surfaces of tools.

How's Your Supply of

Skilled Welding Operators?

Need for trained welders will be accelerated as production of military materiel gains momentum. To meet the demand, established welding schools and plant training programs must be integrated with the requirements of welding departments

By ORVILLE T. BARNETT
Metal & Thermit Corp.
Pittsburgh

NO MATTER what happens to the present conflict in Korea, the United States is definitely committed to a build-up of military materiel for the next several years. This necessitates greatly increased welding activity. Every welding fabricator, large and small alike, must look to his supply of skilled welding operators.

Welding operators may be developed from three prime sources:

1. Private trade schools
2. Public vocational training schools
3. Plant-operated training programs

All of these sources have good and bad features which must be evaluated before any company adopts the plan best suited to its needs.

Private Trade Schools—Present-day schools, for the most part, use modern equipment and up-to-date methods to teach gas cutting, gas welding and arc welding. Economic necessity often restricts the practice by students to thinner metals and smaller rods or electrodes than are normally encountered in industrial practice. However, the basic manipulations are similar so this is not a serious handicap.

Does the private trade school teach what you, the employer, want your welding operators to know? Investigation by properly qualified company personnel will soon answer this question. If the product turned out by the trade school can be quickly assimilated into production welding activities, all is well. If the training given is inadequate, the trade school proprietors may be willing to adjust their curriculum accordingly.

An additional point in favor of private trade school graduates is the fact that they have paid their own money to learn the welding trade. Although this investment of personal funds will not make silk purses out of sows' ears, it does tend to select individuals with above average initiative and drive. Some

Students working on gas welding exercises

further testing by company personnel officers is suggested prior to hiring.

Public Schools—In our present technological society, more attention is being directed toward vocational training in secondary schools. Recognition is being given to the needs of industry and the best interests of many high school students who plan to learn a trade while still in public schools. While such pupils do not pay for training in welding, they otherwise offer many of the same possibilities outlined for the private trade school students.

Once more there is a definite need for investigation of the public vocational training schools. Because they are part of a public educational program administered by a board of education, they may have less flexibility than the private schools. It may be more difficult to achieve an ideal marriage of curriculum and equipment with the industrial needs of the community. Still a patient, constructive liaison between industry and public vocational school can bring about the most useful development of practical welding operators. Quite often the school administrators welcome experienced help from industry.

Plant-Operated Training—For a large plant with rapidly expanding welding operations existing schools may not be able to supply enough graduates to man the torches. In cases of this nature plant-operated training programs offer a means to increased welder supply.

Very often industrial executives feel that they are qualified educators by virtue of long experience with welded fabrication. Frequently this is an erroneous assumption. A good plan suggests reviewing an outlined training course with a professional educator. At the same time the qualifications of the director of the training activities could be discussed with the experienced teacher. And a good double check on curriculum might be sought from several welding engineers of recognized ability.

Certain questions come to mind when the training program is conceived: Where will the trainees be found? Who will instruct them? What equipment and supplies are needed? What will they be taught?

Finding the Trainees—Any plant workman in an unskilled occupation is automatically a candidate for the welding school. Plant morale can be improved through giving laborers, sweepers, chippers and other low-skilled workers an opportunity to learn a trade.

But some plants do not have a labor pool from which to draw. These companies often hire potential welders from the open market and pay the candidates while they attend welding school.

In either case, training will cost money and the prospective welders must be screened. Sometimes a counseling service may set up or conduct tests in cooperation with the personnel department. Economy suggests choosing carefully to get choice hybrid seeds that should yield a bumper crop of good welders.

Obviously the trainees should have average or better intelligence. They should exhibit mechanical aptitude. Potential welders ought to be healthy, strong enough to do the work and well enough to have a good attendance record. And they should reveal a proper attitude toward the work they will be doing. All of these points may be covered quickly and well by a series of tests that will save both time and money by keeping square pegs out of round holes.

Instructor supervising a gas welded flat butt weld. Best time to teach pride of workmanship is in the training school

Needed: Mechanical Ability—Mechanical aptitude is necessary to the manipulations required of the average welder. Changes in the molten pool and slag covering must be recognized by the eye, comprehended by the mind and translated into quick action by the hands. Elementary mechanical ability may be needed to improve fit-up and to spot and correct improper alignments prior to welding.

While most welding activities do not involve heavy physical labor, the work is frequently fatiguing and often involves cramped positions. The trainee must be healthy enough and strong enough to be able to take the strain of the job for a full 8 hours. His vision need not be perfect but should be good enough to follow the flame or arc through a dark filter lens.

Almost perfect hearing is desirable in order to discern correct arc sounds as well as for safety reasons in a busy weldery where moving cranes and trucks are equipped with warning sirens or horns. The healthy trainee needs a good disposition, too. No matter how exasperating the arc blow, no matter how often he burns through on thin metal, no matter how awkward the position in which he must stand, he should not blow his top.

Because of the loss of co-ordination with advancing age, the best students are under 30. From 30 to 40 is still a good age group and acceptable welders may

be developed. While the ability to learn remains intact after 40, the time delay from eyes to mind to hands impairs dexterity in the older group. Of course the normal differences among individuals suggests some latitude in age groups.

Failures Weeded Out — Intelligent selection of trainees can weed out potential failures. During the last war one concern reported less than 0.2 per cent failure in over a thousand selected candidates.

Unquestionably the increased demand for welders will bring back the women. In some industries—aircraft welding may be the outstanding example—women exhibit a higher degree of dexterity than men. But they are not restricted to thin metals and delicate welding operations. Strong, husky women right now are pouring molten steel from large diameter electrodes in the rugged fabrication common to the freight car builders.

How To Select the Instructor—A welding instructor must know the basic skills and manipulations of welding. Practical knowledge ought to be supplemented with enough metallurgical and engineering background to answer students' questions. The instructor must be able to inspire the trainees to work industriously and well. And above all he must be able to teach, to explain what he does and why to achieve the desired results.

Equipment Fits the Need—Insofar as possible all equipment and supplies in the school should be similar to those used in actual production. It would be foolhardy to train welders on alternating-current equipment, for example, when all of the production welding is done with direct current which poses the additional handicap of arc blow. The reverse situation would be more practical. Still the best bet is to match training and manufacturing equipment. Usually the older equipment can be installed in the welding school because service demands are lighter and failures in operation should be less serious. In fact simple maintenance of school equipment teaches the trainee more about his job.

Where production gas cutting or welding is the end product of the welding school, apparatus should match that used in the shop. Also, the trainees must be instructed in the careful handling of gages, torches and tips including whatever cleaning and drilling is required to maintain the tips in the best operating condition at all times.

Individual Booths Needed—For either gas welding or arc welding, well ventilated and well lighted individual booths are recommended. Not only will distractions created by other students be minimized but also dangers of burns from flying incandescent metal and slag or danger of eye injuries from arc flash will be lessened. Sturdily constructed welding booths will reduce noise interference while the student listens for arc sounds. Good ventilation assures healthful working conditions while keeping vision at good levels without the need of peering through a fog welding smoke.

Most trainees will be bothered by low light levels where filters absorb too much visual light along with the harmful rays. Mirror type filter lenses are becoming increasingly popular because they transmit some 40 per cent more visible light while reflecting the harmful short waves. Good floodlights, too, are recommended to dispel the gloomy darkness of the strange new welding world confronting the student.

Well fitting, comfortable leather clothing, helmets, goggles and other safety equipment will hasten the training.

In arc welding, electrodes form part of the supplies. Some years ago it was common practice to commence training with bare or lightly covered electrodes. These were the most difficult to use and the tough instructors could break many neophytes quickly. No one would teach a baby to walk by starting him across a 12-inch beam many stories off the ground in case he might ultimately be destined to become a construction worker. So present-day thinking suggests the selection of highly stabilized E-6013 electrodes to give the beginner an early confidence in his eventual mastery of the welding manipulations. Next E-6012, E-6010, E-6020 and E-6016 electrodes will provide means for further refinement of techniques provided that these types are used in plant operations.

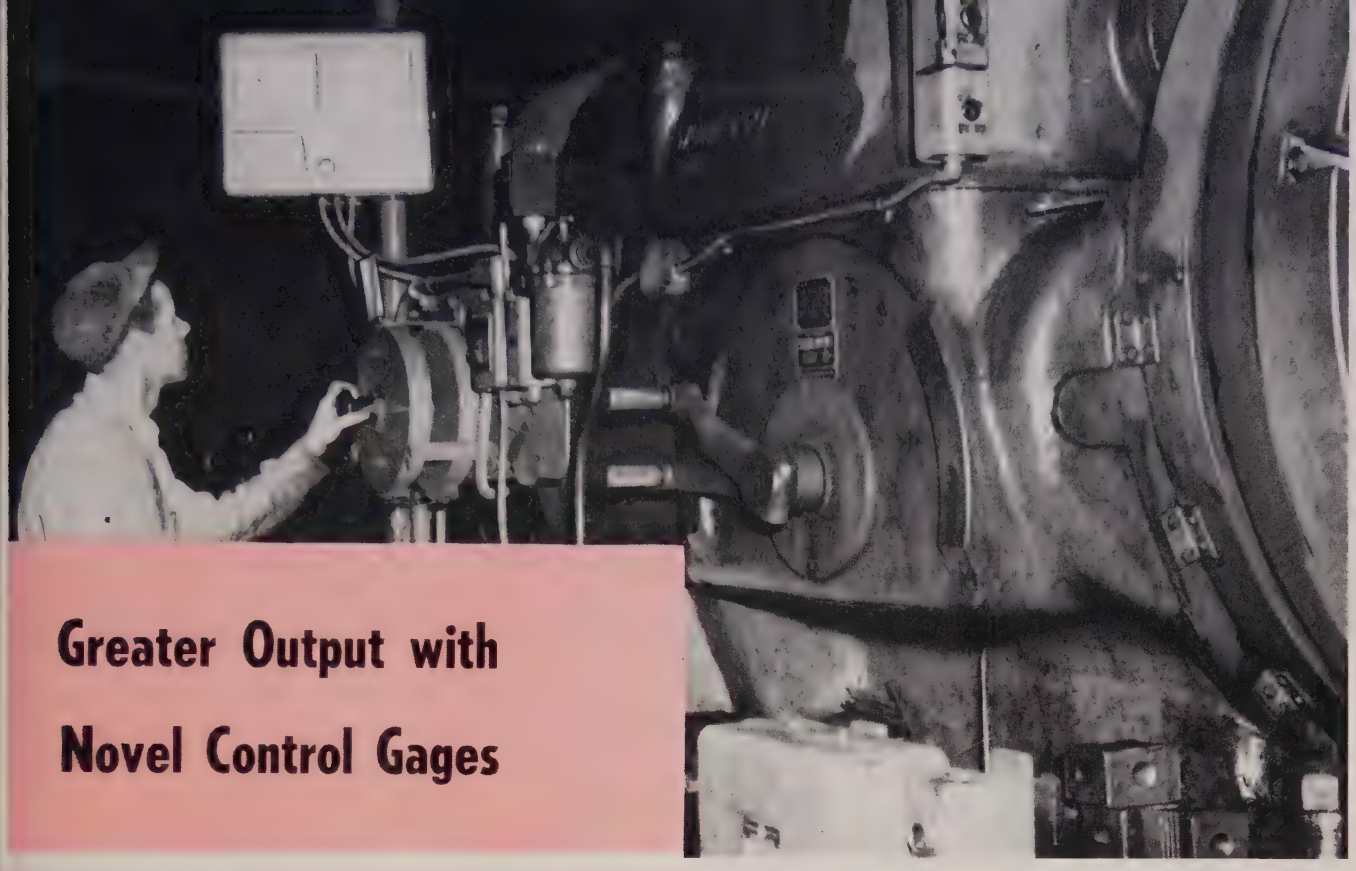
What To Teach—Assuming the training director is starting from scratch, where does he go for help? To the American Welding Society of course. In its 1951 order form for codes, standards, specifications and books on welding and allied processes are listed nine different publications pertinent to welder training. Among these will be found a "Code of Minimum Requirements for Instruction of Welding Operators." Five other texts prepared by companies in the welding industry detail suggested lessons and exercises.

Training programs vary from 20 to 400 hours of work depending on the level of skill needed by the graduate. Obviously it does not take forever to develop a tack welder. A welding job that consists of running downhand fillets with an E-6012 electrode does not have a prerequisite of hundreds of hours of schooling. But the welding of chrome-moly power piping with precisely controlled preheat and interpass temperatures with searching x-ray and Magnaflux inspection, with closing joints in catch-as-catch-can positions cannot be entrusted to welders who have been quickly taught superficial skills.

Some of the occupational requirements have been outlined by the occupational analysis unit of the United States Employment Service. Some definite teaching material may be obtained through the Instruction Materials Unit of the U. S. Office of Education. No one should overlook the welding equipment suppliers and manufacturers when setting up operator training courses.

A certain amount of theory is desirable. Even in the hands of able teachers talks on theory may be a miserable mixture of boring and bewildering information. That's why sound or silent movies can be adopted to present the background.

The American Welding Society provides an excellent list of available topics. Typical titles include: Arc welding stainless steels, brazing aluminum alloys, under water welding, welding heavy wall cast sections, working of magnesium, fundamentals of silver alloy brazing, prevention and control of distortion in arc welding, story of arc welding.



Greater Output with Novel Control Gages

By C. W. HEPPENSTALL
Vice President
Heppenstall Co.
Pittsburgh

Twingage mounted on a rough turning lathe. Gage on left shows diameter and gage at right indicates percentage of full load on main motor drive

ROUGH machining with tungsten carbide is a fairly recent development in the U. S. even though finish machining operations using the material are well established. When it is known that tungsten carbide will remove five to ten times the metal that standard high-speed tools remove, it becomes necessary to learn how to use this faster cutting medium.

The first problem is to get machine tools that will perform without vibration, have adequate horsepower and the surface speeds required by tungsten carbide tools. Most plants need new machine tools properly constructed to make use of tungsten carbide but it is a mistake to think that machine tools cannot be modified to use tungsten carbide fairly successfully. Many machine tools can make the shift as illustrated by Heppenstall Co. in modifying a lathe built during the Spanish-American War, for mid-20th century cutting tools.

Custom Designed—German machine tool builders went further than those in the U. S. in the design and manufacture of machine tools that are really suitable for the use of tungsten carbides. Two German lathes and a Heppenstall improved high-speed trepanning lathe were described in the Mar. 12 issue of STEEL, p. 87. Both German machines, the high speed trepanning lathe and the rough turning lathe, were equipped with two meters to aid the operator. Some British machine tools are equipped with similar meters. Load on the motor in kilowatts is indicated by one meter and the other indicates the main spindle speed in rpm.

From these basic ideas Heppenstall designed, built and is using an unusual instrument called a "Twingage." It provides a method of maintaining a given surface speed by means of a voltage generated in direct proportion to the spindle speed of the machine and modified in an electrical network so as to indicate the required spindle speed in terms of the diameter of the workpiece. Desired surface speed is selected by setting the surface speed at a 12-position rotary switch and adjusting the spindle speed of the machine so the reading on the "diameter" meter agrees with the diameter of the piece being turned.

Gages Performance—It further provides a means for indicating the percentage of full load on the main motor drive by a reading on the meter face marked "Power." Depth of cut and/or feed can be increased to the practical limit determined by tool life, finish required or the power limitations of the machine. Once this is established, the per cent load reading on the meter should be constant for a given setup and any deviation indicates worn tools, improper grinding of tools or a difference in material being worked.

Greatest use of the instrument is in the program of modifying present machine tools for tungsten carbide use. It can be applied for rough turning lathes, turret lathes, boring lathes, high speed trepanning lathes, vertical or horizontal boring mills, milling machines and cylindrical grinders. Once good tungsten carbide applications are established, its use means a production increase of 20-25 per cent and gives

	Without Gages	With Gages
Horsepower	35	55
Rpm	55	72
Sfm	133	175
Depth of cut	0.625	0.625
Feed	0.032	0.032
Micro-Finish	250	250
Lb removed per hr	615	800
Cu in. removed per hr	2,100	2,826

the operator guide posts for similar jobs in terms that are easily understood.

Performance of a rough turning lathe equipped with tungsten carbide tools and machining alloy steel is compared in the accompanying table both with and without a Twingage. Material is the company's grade 2C30, similar to AISI-4340 modified. Dimensions after turning are 9¼-inch diameter by 110-inch length.

Oil Baffle Holder Made

Production of a self-retaining push-on type Speed Nut to secure the oil baffle in an automobile engine is announced by Tinnerman Products Inc., Cleveland. It is the latest in a list of more than 1500 special fasteners made by the company to lower auto assembly costs.

Fastener incorporates two small spring arms that snap into holes in the baffle, making it self-retaining. The baffle is then positioned on the engine block studs and pressed into place. To overcome wide tolerance variations on the casts studs and give the push-on extra flexibility, prongs are specially notched. Heat treated spring steel, 0.022-inch thick is used to make the fastener.

"Electric Eye" Milling Machine Translates Drawing to Finished Part

VERTICAL milling machines with electronic control of longitudinal and cross travel movements—providing for machining to patterns on glass plates scanned by an "electric eye"—are in production at Kearney & Trecker Corp., Milwaukee. The machines are the result of several years of research and development in tracer control.

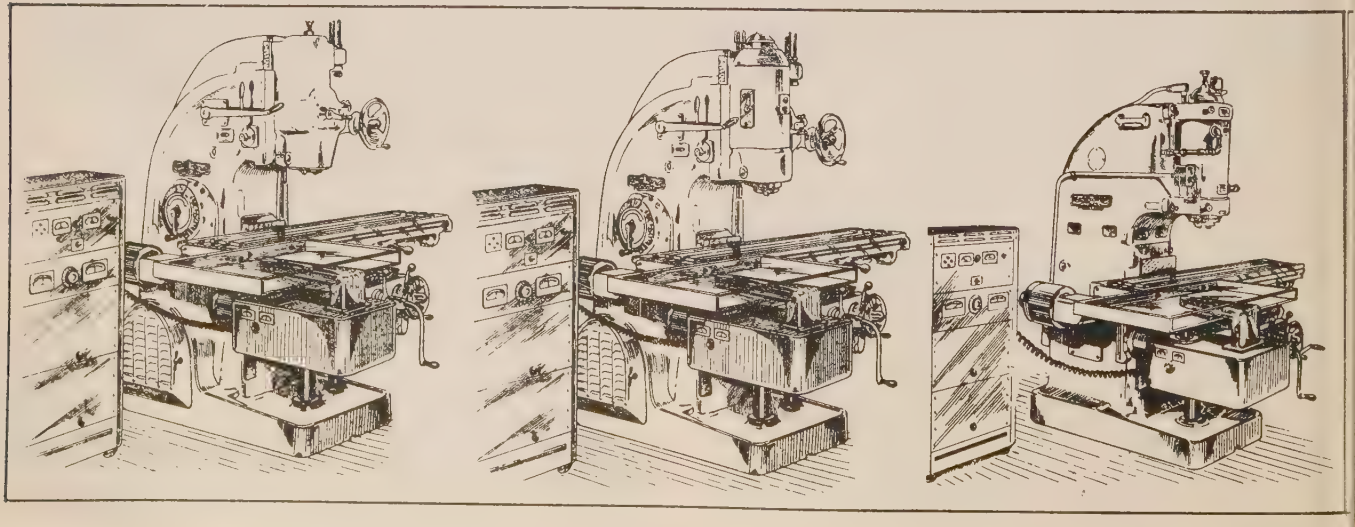
A photoelectric cell, when combined with a parallel ray light source and a rotating aperture, provides great accuracy for automatic contouring through 360 degrees. Directional movements of the table are controlled by an opaque template on a clear glass surface or by a scribed transparent outline on an opaque coated glass plate placed in the tracing zone.

The overall tracing feed range is from 0 to 100 inches per minute and is broken down into three ranges by pick-off gears (0 to 10, 10 to 33 and 33 to 100) with infinite changes in between controlled by dial.

The tracer unit was developed for application to No. 2 model CH and No. 3 model CK machines. Tracing area on the No. 2 size is 10 x 12 inches and 12 x 34 inches on the No. 3. The new machine looks like a standard vertical miller, except for the addition of a gear case on the front of the knee, and a glass platen, for the templates, at the left of the table.

Other features: Special screws and ball bearing nuts for table and saddle feed drives to eliminate backlash; direct-current feed motors; manual declutching arrangement to convert machine from tracer control to conventional operation; and an eight-way directional table control to aid in setting up the tracer system or in milling areas beyond the traced pattern.

Three basic variations of tracer control applied to vertical milling machines. Left, tracer apparatus on a standard vertical with sliding head. Spindle is driven from main motor in column. Center, tracer control on vertical machine with a dual speed range spindle head. Ranges are 150 to 1000 rpm with eight changes, and a fixed 3600 rpm high range. An alternate high speed of 7200 rpm can be provided. Right, tracer control applied to vertical machine with fixed spindle head. Single speeds of 3600 or 7200 rpm are available, or an infinite range between the two



CALENDAR
OF MEETINGS

† *Denotes first listing in this column.*

May 28-31, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: Greendale, Mass.

May 28-June 6, World Petroleum Congress: The Hague, Netherlands.

May 28-June 8, Canadian International Trade Fair: Exhibition Grounds, Toronto, Ont.

June 4-6, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22.

June 6-7, American Society for Personnel Administration: Annual convention, Hotel Statler, New York. Society address: 2917 E. 79th St., Cleveland 4.

June 6-8, The Aluminum Association: Spring meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17.

June 6-8, American Leather Belting Association: Spring meeting, Pocono Manor Inn, Pocono Manor, Pa. Association address: 41 Park Row, New York 28.

June 10-12, Liquefied Petroleum Gas Association: Mountain States Convention & Trade Show, Troutdale-in-the-Pines, Evergreen, Colo. Association address: 11 S. La Salle St., Chicago 3.

June 10-13 & 13-16, National Metal Trades Association: Annual western plant management conferences, Dell View Hotel, Lake Delton, Wis. Association address: 122 S. Michigan Ave., Chicago 3.

June 11-13, American Supply & Machinery Manufacturers Association Inc.: Industrial supply convention, San Francisco. Association address: 1346 Connecticut Ave. N. W., Washington 6.

June 11-13, Symposium — "Analysis and Metallography of Titanium:" Illinois Institute of Technology, sponsor, Sheraton Hotel, Chicago. Institute address: Technology Center, Chicago 16.

June 11-13, Electric Metal Makers Guild Inc.: Annual meeting, Seignoiry Club, Montebello, Que. Guild address: Box 6026, Washington Station, Pittsburgh 11.

June 11-14, American Society of Mechanical Engineers: Semi-annual meeting, Royal York Hotel, Windsor, Ont. Society address: 29 W. 39th St., New York 18.

June 11-14, American Boiler Manufacturers Association & Affiliated Industries: Annual meeting, Skytop Lodge, Skytop, Pa. Association address: 613 Perry Payne Bldg., Cleveland 13.

June 13-15, Southeastern Conference on Industrial Organic Finishing: Bristol, Tenn.-Va., Foreman's Club, sponsor, Senior High School, Bristol, Tenn. Conference address: R. K. Cooper, Monroe Calculating Machine Co., Box 191, Bristol, Va.

June 15-30, Seattle International Japanese Trade Fair: Edmundson Pavilion, Seattle. Address: Port of Seattle, Box 1878, Seattle 11.

June 17-20, National Metal Trades Association: Eastern plant management conference, Mayflower Hotel, Plymouth, Mass. Association address: 122 S. Michigan Ave., Chicago 3.

†June 18-22, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 1916 Race St., Philadelphia 3.

†June 24-26, Malleable Founders Society: Annual meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland.

†June 24-26, Alloy Castings Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y.

†June 24-27, National Association of Cost Accountants: Annual international cost conference, Palmer House, Chicago. Association address: 505 Park Ave., New York 22.

†June 25-29, American Institute of Electrical Engineers: General summer meeting, Royal York Hotel, Windsor, Ont. Institute address: 33 W. 39th St., New York 18.

FLEXIBILITY IN MANUFACTURE MEANS LOWEST COST PER PIECE

Products designed to utilize the economies of welded steel can be manufactured at lower cost regardless of quantity produced. Any product design can be developed from an unlimited combination of steel shapes to suit the type of manufacturing equipment available.

Each of the tee sections shown has been designed to withstand equivalent loads. As quantities of production increase and brakes, shears and forming equipment become advisable, less material is, of course, required and the amount of welding itself can be reduced.

Your Lincoln Welding Engineer will gladly explain how your products can be simplified and fabricated at lower cost using welded steel construction. Simply write The Lincoln Electric Company, Cleveland 1, Ohio.

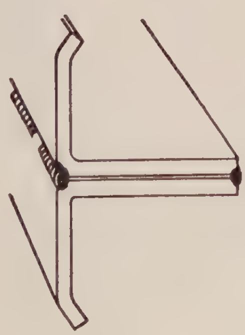


Fig. 3. Angles, brake formed *from plate, have better dimensions to withstand loading. Section requires only light, intermittent welds. Costs 30% less than Figure 1.*

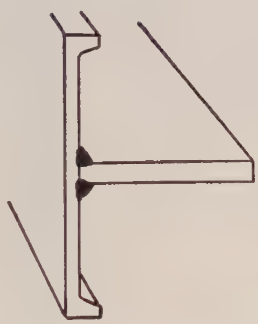


Fig. 4. Tee section *fabricated from light channel is automatic Lincolnwelded to plate cut to shape by high speed equipment. Gives better material distribution. Costs 35% less than Fig. 1.*

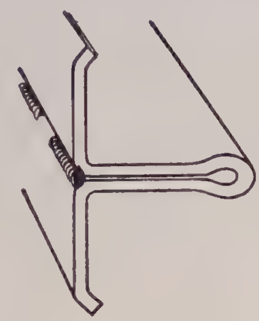


Fig. 5. For higher quantity production, *tee can be brake formed as a single piece from sheet and automatically Lincolnwelded at top. Weighs 30% less than Figure 1 . . . costs 40% less.*

the ACTUAL

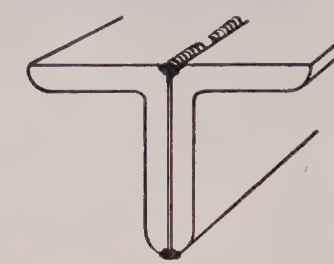


Fig. 1. Tee section *fabricated in small lots by welding standard angles back to back. Requires only hack saw and welder.*

increasing the YIELD

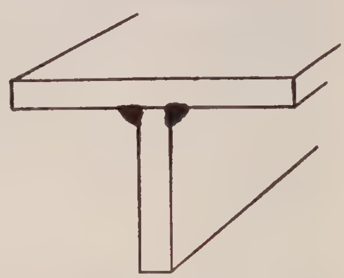


Fig. 2. Tee section *for medium quantity lots for the shop having shear or flame cutting equipment. Costs 25% less than Figure 1.*

the IMMENSITY of the POSSIBLE

Economical production regardless of quantity

SEE HOW WELDED STEEL IS FABRICATED AT LOW COST

Machine Design Sheets free on request to designers and engineers. Write on your letterhead to Dept. 66

THE LINCOLN ELECTRIC COMPANY
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Ordnance Experiments Unveiled

Completion of extensive experiments directed at saving time and materials in the production of metallic belt links for machine gun ammunition is announced by Quality Hardware Division of Continental Copper & Steel Industries Inc. The experiments were conducted jointly by the company and the Rock Island Arsenal of the Army Ordnance Department.

Failure of a machine gun belt to feed continuously and smoothly, because of faulty links, would be tragic for machine gunners. Quality Division engineers have devised new processes and methods to produce 0.30 and 0.50 caliber sizes, made of cold-rolled carbon strip steel. After heat treatment, the links are subjected to a rust proofing process.

The original 0.50 caliber belt link die they produced was developed in 1932. It was a seven-station progressive die and represented a definite advance in making links, since seven separate punch press operations under the old method were concentrated on one machine.

Eight years later the operation was further improved with a die requiring material not as wide as was used in the past. A new progressive die was then developed that had four stations. By eliminating three stations, this new die reduced maintenance cost about 40 per cent. Coupled with a reduction in the multiple length of each link, it effected a saving of about 26 per cent of the material required by the 1932 model die.

Realizing there was more to do, they also produced a set of master contour gages, a setting gage and a special grinding machine. In addition, an automatic feed unit, which can check and gage as many links per shift with two operators, as formerly required ten has also been developed and released to the trade.

Flame Rectification Discussed

A new 32-page catalog—"Protectoglo Combustion Safeguard for Industrial Gas-Fired and Oil-Fired Burners" has been published by the Industrial Division of Minneapolis-Honeywell Regulator Co. It is actually a complete manual on flame failure protection for industrial applications. Included is information on the new "flame-rectification principle" of operation, descriptions of the many types of system components, installation drawings, bills of material, and comprehensive information on twenty-four different safeguard systems.

Copies may be obtained by writing to Wayne and Windrim Aves., Philadelphia 44, Pa.

Upper picture is of Lathe and Tool Departments. Lower view taken in Milling Department. Cranes are hand-propelled with electric hoist.

OVERHEAD CRANES

Speed Production of MONARCH LATHES

As one of the foremost lathe builders with a modern plant and reputation for efficient operation, it is interesting to note the extent to which The Monarch Machine Tool Co., Sidney, Ohio, makes use of Cleveland Tramrail overhead cranes.

In every direction through the many departments, one sees the familiar arched beams of Cleveland Tramrail cranes and runways. In constant use, they handle parts to be machined, aid in fitting and assembly operations, move completed lathes and do a host of other work.

The cranes make the handling of materials easy and safe. They speed production because the skilled machine operators can move the heavy parts in and out of the machine tools quickly without help. As one or several cranes are provided in each bay according to the need, there is no lost time waiting for use of a crane.

If you are interested in ways of improving plant efficiency you will be interested in Cleveland Tramrail.

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THE CLEVELAND CRANE & ENGINEERING CO.
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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Steelmakers' Goal: Maintain High Output

Emphasis at last week's AISI technical sessions on methods of improving fundamental steelmaking practices to assure continued capacity operations

STEELMAKING, sinter, raw materials and plant operation—those are the major topics the steel industry's experts discussed at the four technical sessions of the American Iron & Steel Institute's 59th general meeting in New York last week. All the papers contributed practical solutions to production problems faced almost universally by steel companies. Here are summaries of some of the papers:

Oxygen for Increasing Bessemer Production

W. G. McDonough, superintendent, open hearth and bessemer department, National Works, National Tube Co., McKeesport, Pa.:

Oxygen offers a practical means for melting additional scrap in bessemer converters to increase ingot tonnage when a deficiency of hot metal exists. By using 4000 to 6000 cu ft of oxygen per blow, the normal steel scrap charge in a 60,000-pound blow can be increased about 4000 pounds. In replacing 4000 pounds of hot metal per blow with 4000 pounds of additional steel scrap, more hot metal is made available for both liquid open hearth and bessemer charging, thereby increasing open hearth and bessemer ingot tonage.

Blowing time, under this usage of oxygen, can be decreased about one minute per blow. Experience at this plant indicates the existence of a definite relationship between hot metal, scrap, and oxygen usage, beyond which one dare pass only at the expense of quality, yields, and costs. Oxygen in acid bessemer converters to increase production should be used judiciously.

The 99½ per cent oxygen used for blast enrichment is furnished by the local plant driox station located about 500 feet from the bessemer converters. Liquid oxygen is shipped into the plant in tank cars and transferred to a storage tank of 1.5 million cu ft equivalent gas capacity, which in turn supplies three 50,000 cu ft oxygen converters.

To provide enough oxygen for use in the bessemer, it was first necessary to increase the heating capacity of the driox system; this was accomplished by merely increasing the steam input to the heaters. Under the present heating arrangement, the plant can deliver about 600,000 cu ft of gaseous oxygen daily, 200,000 of which is available for use in th bessemer converters under a line pressure of 125 ps

Air Temperature in Open-Hearth Operation

John S. Marsh, research engineer, Bethlehem Stee Co., Bethlehem, Pa.:

Principal function of the open hearth is to suppl high temperature heat in amount sufficient to mak steel. A useful approach to how it accomplishes thi is through the notion of theoretical flame temperature defined as the ratio of heat input to heat content c the combustion products. Main sources of improve performance through increased flame temperatur are: Use of combustion oxygen and increased ai temperature.

In the belief that not enough information was avai able on air temperature of open-hearth furnaces, measuring device was designed, built, and used ex tensively. It proved to be an extraordinarily sensitiv tool for diagnosing furnace behavior. A principal find ing is that air temperature has large influence o heat time. In fact, its influence is powerful enoug to nullify other factors to the extent that, on th average, heat time is inversely proportional to a temperature.

For a given furnace and range of fuel input, princ pal determiner of air temperature is air leakage. Thu best performance means careful attention to sealin of openings in the regenerator system, which extend from reversing valve to port. Over-excess primar air is equivalent to early leakage. Indications are thu that an air-temperature device would be highly use ful for permanent installation. Its development is i progress.

Direct Reduction of Iron Ore Using Fluidized Solid

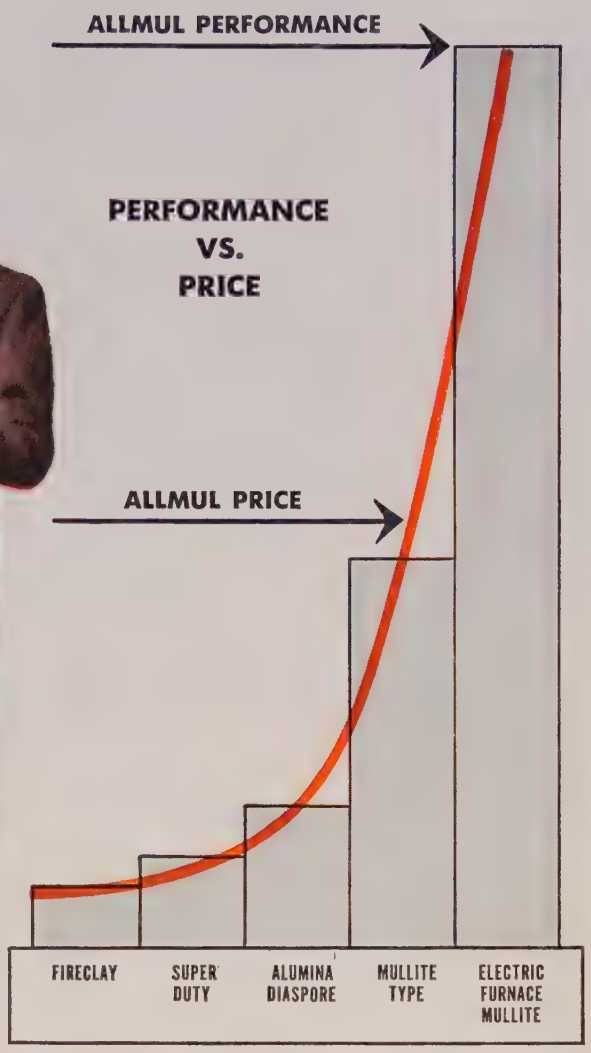
M. Tenenbaum, control metallurgist and **C. M Squarcy,** assistant superintendent, Indiana Harbo Works, Inland Steel Co., East Chicago, Ind.

The fluidized solids approach to handling finely d vided materials provides conditions of gas solid con tact that appear ideal for promoting the reactions in volved in the direct reduction of iron ores. The fluid ized solids technique consists of suspending finel divided solids in a moving gas stream. The techniqu affords an effective means for roasting iron oxide ma terials to make them amenable to magnetic separatio

In charging to steelmaking furnaces, such as th basic open hearth, it is conceivable that the reduce

I've re-ordered

B&W ALLMUL FIREBRICK



'hat's what scores of users are saying about '&W Allmul . . . the new, remarkable, lectric-fused mullite firebrick. In plant fter plant, Allmul has been *re-ordered* for uch severe service applications as ferrous nd non-ferrous melting furnaces, slag nelting furnaces, butt-weld furnaces, glass anks, checker chambers, ceramic kilns and nany others. *That's proof of performance.*

'here are two good reasons for the welcome Allmul as received. The first is its *price.* Mass-produced by a pecial, highly efficient process, top-quality Allmul omes to you at a price far lower than you would xpect. For concrete evidence, look at the perform- nce-price ratio charted at right.

'he second reason is *staying power.* The panel below ives facts and figures . . . shows why no other fire- rick in Allmul's price range can match its perform- nce. In fact, no mullite brick at any price can better he performance of Allmul.

f you are not yet saving money with B&W Allmul, nay we suggest you investigate this important new irebrick immediately. The sooner you start using Allmul, the greater your ultimate savings will be. END FOR NEW BULLETIN R-29.

ALLMUL is another important refractories development y B&W engineers who have continuously established ew standards in industrial furnace refractories for the ast 30 years.

CHECK THE PROPERTIES OF ALLMUL!

Here's how B&W Allmul stood up under standard tests.

SPALLING—12 cycles of heating to 2550F and chilling in cold air and water spray. **Result—no loss.**

HOT LOAD DEFORMATION—1½ hours at 3050F under load of 3600 pounds per square foot. **Result—less than 2% deformation.**

PERMANENT VOLUME CHANGE UNDER REHEATING—After 5 hours at 3200F. **Result—less than ½% change.**

FACT—no other firebrick in Allmul's price range can match its performance. **Fact**—no mullite brick at **any** price can better the performance of B&W Allmul.

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product could be utilized either a a scrap substitute or as a charg oxide. Some difficulties are encoun tered in direct reduction for the man ufacture of scrap substitute. A sub stitute charge oxide material coul be obtained through incomplete re duction of iron oxide material. A compared to conventional oxides, th use of such incompletely reduced ma terial would result in an increase i the iron units that could be charge to and recovered in a given furnace The application of direct reductio procedures for the preparation of in completely reduced oxides for charg ing to the open hearth might be diffi cult to justify for many materials

Neither in theory nor in practic can direct reduction schemes be con sidered as methods for independen steel production. Under the best con sidered ideas, the directly reduce product must be further refined i some conventional steelmaking uni to convert the iron into a usabl form. Direct reduction processes ca only be considered as a source of ra materials for steelmaking operation and not as a process potentially ca pable of augmenting or replacin existing steelmaking capacity.

Improving Current Practice in Blast Furnace Sintering

Robert E. Powers, Mellon Institut of Industrial Research, Pittsburgh:

Examination of plants and pra tices in making blast furnace sint produces the impression that gre improvements are possible in man directions. Sinter itself can be im proved, both in its level of propertie and in the uniformity of those pro erties. Plants and operating practice can be improved to give closer con trol, greater efficiency and high production rate. Here are some re ommendations:

Plant Design: Reduction of a leakage; more efficient sinter screen ing; gentler systems for cooling an handling sinter; sizing, storage, an controlling rate of return fines; elim ination of fines from sinter before reaches the blast furnace; dust elim nation from both stack gases an working areas; distribution arrange ments for a fluffier bed.

Plant Operation: Increased atte tion to uniformity of bed burnin even at the expense of productio education of operators to functi of instruments, and better maint nance of instruments; vigilant mai tenance.

Blast Furnace Testing: Use of st tistical methods for accurate a praisal of effects of sinter; incorpor tion of sinter quality tests as signif

cant variables, to increase understanding of the importance of various properties; further investigation of effects of sinter containing added basic materials.

Effect of Sinter on Blast Furnace Production

W. E. Marshall, research metallurgist, research laboratories, Armco Steel Corp., Middletown, O.

Serious effort must be exerted to find out what kind of sinter is best and how to make it, in order to obtain its full potential benefit in the blast furnace. The value of sinter must necessarily vary from company to company and plant to plant, depending on what ore it is made from and what it replaces in the burden. An industry-wide program to evaluate sinter is faced with a good many organizational difficulties. Adequate sampling and testing of such a non-uniform product would have to be carried out over a fairly long period of time and would be expensive.

The technical and operating people of the industry are fully capable of organizing and carrying out a satisfactory test of broad scope about sinter if the managements of the several companies wish them to do so. If such a program is organized, these suggestions may be helpful. Each company participating in the program might do this: 1. Make the kind of sinter it believes best. 2. Describe this sinter for the experimental period with agreed tests, adequate in number to show significant differences between sinter made by different plants. 3. Run a blast furnace test at each plant comparing agreed percentages of sinter in the burden, to an all-ore burden composed of ores that would be used if sinter were available. 4. Conduct the blast furnace test in such a way that the following results can be obtained for each different burden: The relation between blowing rate and efficiency, between blowing rate and production and between blowing rate and flue dust.

Open-Hearth Charge Ores

John J. Golden, assistant to vice president, steel production, and **Henry E. Warren Jr.,** assistant general superintendent, Fairless Works, United States Steel Co., Pittsburgh:

Extensive tests made by United States Steel indicate that an ore which works satisfactorily at a given pig percentage in a 120-ton furnace, may be entirely unsatisfactory in a furnace of 225 tons. It is probable that this follows the fact that even though pounds of ore per ton remain

the same for both furnaces, relative time required to heat the center of a pile in the large furnace is more than twice the time required for the furnace of one-half the size using one-half the total amount of ore.

It has also been found that results from the use of fine ore, such as Frontier, Swedish, and others, can be improved by mixing it with more lumpy ores, solely because of the effects created by opening up the pile of ore in the furnace. The more open pile allows the hot metal to mix more readily with the ore earlier in the heat time and also allows combined moisture to escape more easily, which in turn helps to eliminate violent blows in the furnace.

Relative bath depths, firing rates, furnace temperature at charge time, etc., would each have its different effect on results obtained from use of a given ore.

Since ore quality and its physical condition can affect ingot production rates, it is apparent that there is much work yet to be done in the processing of the poorer grades of ore to a form that will provide consistently a charge oxide of suitable size and structure, which will lend itself to maximum production rates and thereby eliminate one of the many variables that affect ingot production rates.

Modern Coal Cleaning in Pittsburgh Area

R. P. Bremer, mining engineer, Youngstown Sheet and Tube Co., Youngstown:

Change from hand loading to mechanical loading, approaching exhaustion of low sulphur coal, and rising labor and materials costs have added serious problems to the preparation of metallurgical coal in the Pittsburgh area. Modernization of existing plants and design of new ones must be justified by a better product or a reduction in final costs at the consumer's plant.

Fine coal screening is still inefficient and costly. Although there has been much improvement in use of alloys and stainless steel screens, replacement is a major item in plant maintenance. Spraying at the coal face, to allay dust, adds much to the trouble of dry screening fine coal. Continued research into the electric heating of screens is clearly indicated. Possible application of ultra-sonics to fine screening and dewatering is suggested as a subject for research. Roofbolting offers some hope of reducing raw coal roof impurities.

Continuous mining methods, although lowering mining costs, will add to the burden of fine coal clean-

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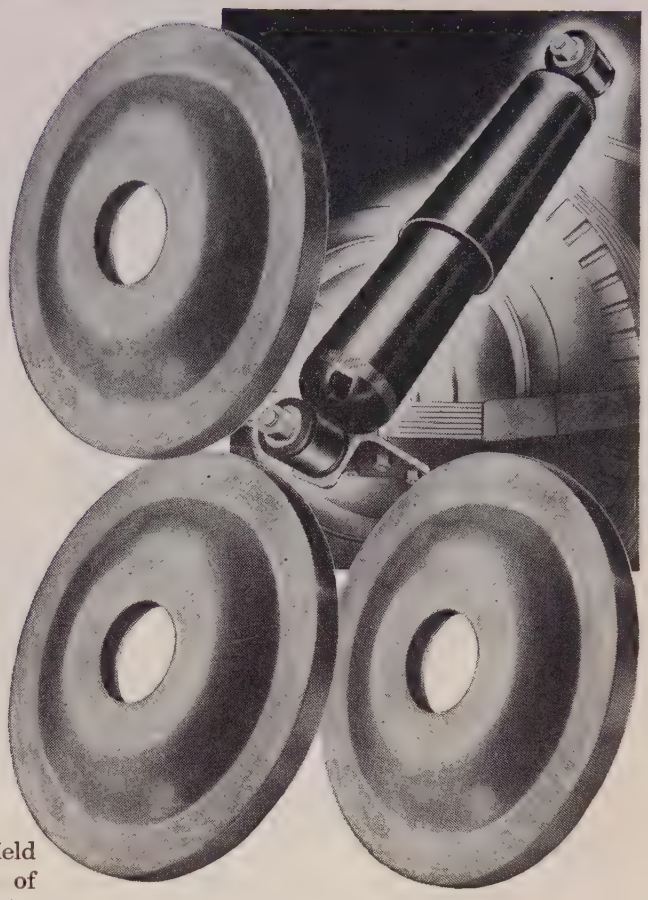

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ing plants by increasing the percentage of minus ¼-inch raw coal. Although existing fine coal cleaning methods are capable of operating efficiently at high gravities, very few, if any, are able to do a good job at low gravities. This need for continued improvement and new methods of fine coal cleaning is the current challenge to preparation research.

Track Time and Soaking Pit Practice Affects Steel Quality

A. F. Mohri, chief metallurgist, Steel Co. of Canada Ltd., Hamilton, Ont.:

Track time influences the quality of many steel compositions, especially from a surface quality angle. Track time does not appear to have much influence on most of the low carbon rimmed and semikilled steels. Such steels can be banked if necessary, and later charged into hot pits with a minimum amount of danger. When it is necessary to resort to such practice, conditioning costs do not get out of line when compared with costs of ingots that were charged direct.

In Stelco's plant, track time means the interval from finish of teeming to finish of soaking pit charging. In calculating time soak, which is a metallurgical requirement, the time interval from start of teeming to finish of soaking pit charging is used. This is done to take into account any detrimental effects of excessively long teeming time.

Track time, except for calculating time soak, is made up of holding plus shipping and charging time. Holding time is specified by the metallurgical department and varies with steel composition and mold size, and may range from 15 minutes to three hours. The steel must be sufficiently solidified to withstand shipping, stripping, and charging. Bridging over in hot top ingots and "cokey centers" (deep etch) in billets have been attributed to insufficient holding time. Alloy steel and high carbon hot topped killed steel require a longer holding time than lower carbon steel because of the greater spread in temperature between teeming and solidification.

Industrial Controls Booklet

Measurement of pH, Redox and conductivity in industrial controls systems is covered in a 24-page technical bulletin No. B 51-2 issued by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia. Fundamental principles of electro-chemical measurements as well as final control elements for automatic control systems are included.

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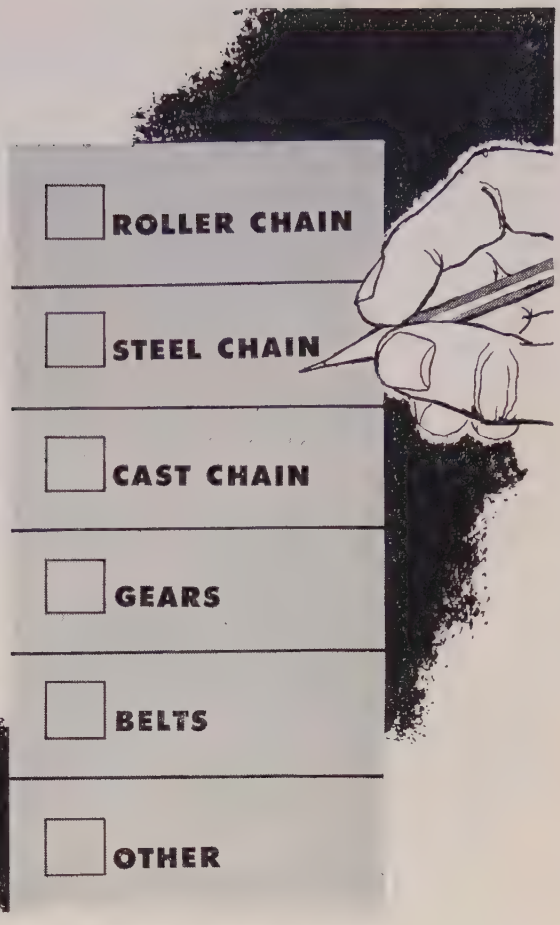

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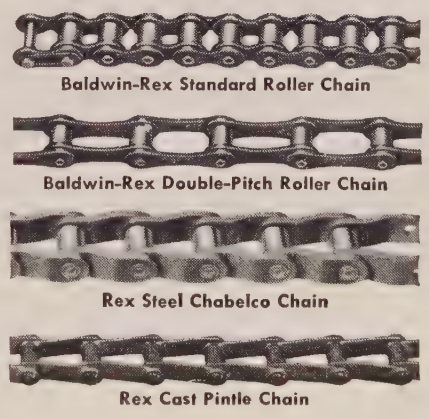

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Friction Tests Run on 20 Special Lubricants

STATIC friction tests of a number of relatively new special lubricants, in combination with various metals, have recently been completed at the National Bureau of Standards. Selection of a lubricant for a particular special application was the immediate goal of the investigations, sponsored by the Naval Ordnance Laboratory.

Static friction coefficients are indices of the ease with which one of two lubricated metal surfaces will start to slide in relation to the other. While low static friction is desirable in many applications, it cannot be taken as an indication of overall lubricant merit.

Some twenty special lubricants, principally chlorinated and fluorinated hydrocarbons with and without various additives, were tested. Additives investigated include graphite, molybdenum disulphide, zinc oxide, boron nitride and an oxidized petroleum compound. An SAE 10 mineral lubricating oil was used as a reference. Metal surfaces used in various combinations for the tests were stainless steel, carbon steel, cast iron, aluminum alloy and chromium plate. An inclined plane test apparatus of conventional design was used.

In the test method employed, a metal rider rests on a larger flat lubricant-coated metal plate. A load of 40 psi was used and a temperature of 100° F maintained. The plate, initially horizontal, is slowly tilted until the rider starts to slide. The sliding of the rider is indicated electrically; a small motion of the rider closes a low-voltage circuit and lights a lamp. The tangent of the angle of tilt at which sliding begins is the coefficient of friction.

MoS_2 Proves Best Additive—Lowest static friction was shown, in general, by test lubricants containing molybdenum disulphide—closely followed by a mineral lubricating grease, dry molybdenum disulphide and a fluorinated hydrocarbon with graphite additive. Lubricants for which the most favorable data were obtained showed static friction about 50 to 60 per cent less than the reference oil. A lubricant containing an oxidized petroleum compound, and one containing a silicone grease, gave slightly less friction than the oil. Higher friction than the reference oil was shown by the chlorinated and fluorinated lubricants without additives and by the remaining special lubricants.

Some of the metal combinations used ranked about the same in friction, relative to other metal combinations, regardless of the lubricant with which they were tested. In the case of certain metal combinations, on the other hand, the relative rank of the combination depended to a much greater extent on the lubricant used.

Certain heat treated stainless steel combinations showed, with most lubricants, the lowest friction values. With a few lubricants, a chromium-plated rider on a heat treated stainless steel plate gave low friction values comparable to those for the stainless steel combinations. Dependence of relative friction rank on the lubricant used was especially great in the case of an aluminum alloy plate used with either a chromium-plated rider or a stainless steel rider, and also for the combination of an SAE 1050 steel rider and a cast iron plate; each of these combinations ranked high in friction when used with one or more lubricants, but low when tested with other lubricants.

Lapped Surfaces Superior—Polished surfaces sliding on lapped surfaces tended to give lower friction and less variation than ground surfaces sliding on ground surfaces. Lapped

plates and lapped-and-polished riders were used in most of the tests. Lapped and polished surfaces are more easily reproduced and are more commonly used for machine parts involving small clearances.

Industrial Air Conditioner

Production of an absorption-type water chiller with a capacity of 20 tons or more, for use with air conditioning units or in manufacturing processes, is announced by Servel Inc., Evansville, Ind.

Due to the government's need for critical materials, the new unit is available for defense orders only. It is designed for conditioning multi-storied buildings, and may be used in factories, offices, government buildings, and a host of other multiple-room applications connected with the defense effort.

The unit's nominal refrigeration capacity rating is 20 tons when it supplies chilled water at 45 degrees, and uses 360 pounds of steam per hour, and condensing water at a temperature of 85 degrees. If condensing water is available at temperatures below 85 degrees, or more steam is supplied, the result will be more than 20 tons of capacity.

"This is the largest refrigeration unit Servel has ever built," Mr. Gilbreath said, adding that it will not be in competition with the three-ton and five-ton All-Year air conditioners which Servel is continuing to produce for homes and small commercial

Fixture Aids Rotor Production

ROTOR assemblies are held vertically by core and shaft assembly fixtures while heated core cools and shrinks to tight fit on shaft at Westinghouse Electric Corp. Height of each fixture supports shaft in proper longitudinal relation with core. Production averages more than 100 rotors per hour

installations. Servel stated the 20-ton water chiller is indicated for many buildings and industries that have a need for controlled temperature and humidity.

The new unit is designed to deliver refrigeration in the form of chilled water, which is piped to separate air conditioner units, containing filters, coil and fan. For winter operation, hot water may be supplied through the same piping system.

The 20-ton water chiller is exceptionally compact. It is 30 inches wide and less than eight feet long, occupying only 19 square feet of floor area. It can be carried into a building through a standard-width door.

Tabletting Carbide Tool Tips

Tungsten carbide tool tips are now being produced at the rate of 30 per minute through the aid of tabletting presses made by F. J. Stokes Machine Co., Philadelphia.

The caked powder carbide after being baked at 2600° F is mixed with varying amounts of cobalt, depending on the hardness or toughness desired, and fed into the press' dies in precise quantities where it is subjected to pressures of more than 30 tons. Uniform compacting pressure is important to achieve uniform pieces since, because of high shrinkage with this material, pre-sintering conditions must be identical.

Sintering converts the fragile briquettes into strong metal parts used for high machining speeds. High cost of tungsten and shortage of cobalt make low cost of production of these tool tips both fundamental considerations.

Strain Gaging Examined

First of an extended series of regional conferences for co-operative study of present and potential uses of bonded resistance wire strain gage devices was held recently at the University of Pennsylvania, Philadelphia. These conferences are offered as a means of opening new avenues of creative thinking in research, engineering and instrumentation. Dates and locations of several future conferences, to be held from coast to coast, are yet open to arrangement.

The Philadelphia conference, held in three sessions and attended by more than 400, was sponsored by eleven colleges and universities and by Baldwin-Lima-Hamilton Corp., Philadelphia. Representatives of the colleges served as a discussion panel.

Mr. Tatnall, dean of the Baldwin testing department, spoke on "The Past, Present, and Future of the SR-4" and presented a "parade of ideas" built around an exhibit of new and suggested types of strain gages and their applications during the 12 years these gages have been available. Applications were demonstrated and explained by means of drawings or the actual devices.

Among devices presented were extensometers, high temperature strain gages, a feeler gage for exploring thickness variations, a commercial engine indicator, basic measuring elements for detecting yield point and indicating how much permanent set is required in straightening bars, pipe, etc.; and simple, low cost strain gage units for measuring three and six components of forces without interaction. Topics for panel discussion included the operation and problems associated with these devices, and such other related subjects as service loads, thrust, impact, vibration, fatigue, temperature, telemetering, aerodynamics, circuits.

New Tape Aids Packaging

Today, a fresh concept of package strengthening has evolved to supplement the packager's tools, improve his methods, and help prevent pilferage. A new gummed product named Tape-Strap incorporating these characteristics, has recently been introduced to the trade by Mid-States Gummed Paper Co., Chicago. Its function is to strengthen a package by becoming part of it. That is, the package and reinforcing material are integrated neatly, quickly and effectively into a single working unit. This property means better utilization of the properties of cartons and other packaging media, states the producer.

The product is strong, averaging 180 pounds per inch of width in tensile strength. It is pliable. It is safe, easy to handle and requires no intricate techniques or special application equipment. In construction, it consists of a multitude of tough, resilient, pliant shock-resisting fibers, lineally aligned, and laminated between two sheets of kraft paper. One kraft sheet is coated with a high-strength pure animal glue.

This construction combines all of the following properties: High strength, both tensile and tear—the tear strength across the fibers exceeds the range of the standard Elmendorf test; fast, permanent adhesion to a variety of surfaces (boxboard, kraft liner, paper wrapping, etc.); flexibility; excellent shock-resistance; and "balanced adhesion" which means a proper balance between all the properties of the glue. In particular "balanced adhesion" indicates the optimum balance between the initial "tackiness" or "grab" of the wet glue and the "tack life" of the glue after moistening.

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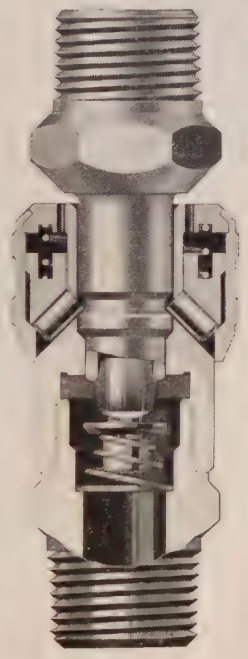

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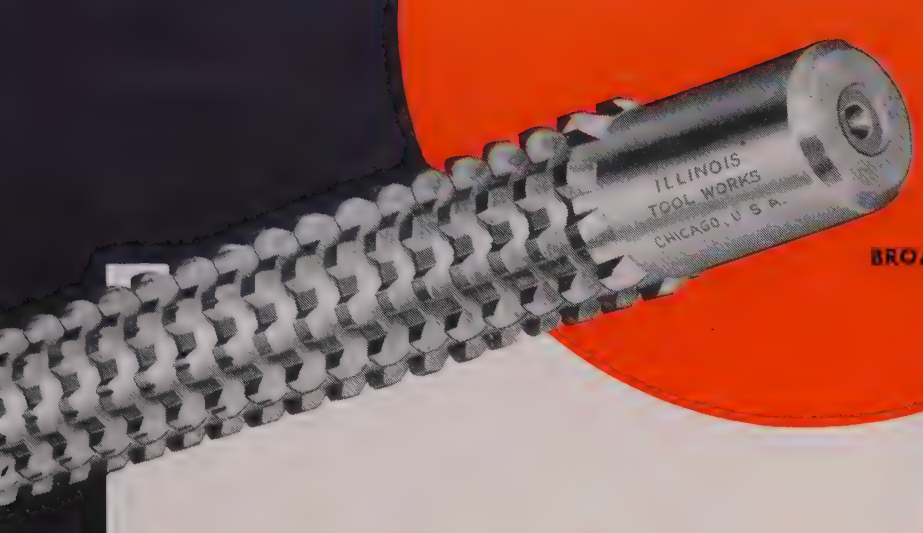

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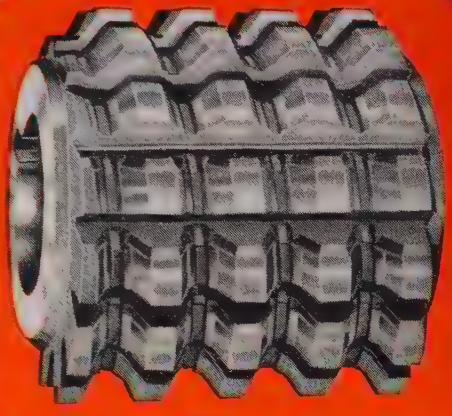

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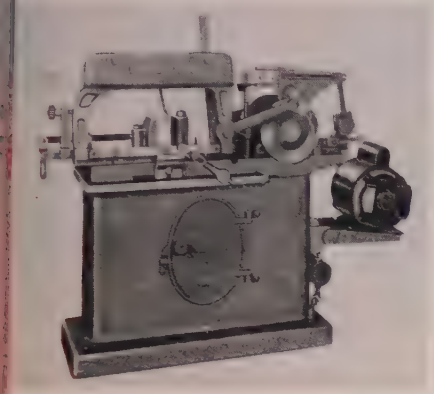
New Products and Equipment

Power Hacksaw

A heavy duty power hacksaw addition to the Keller line is announced by Sales Service Machine Tool Co., 3363 University Ave., St. Paul 4, Minn. Model No. 3CH has a 6-inch stroke, a built-in coolant tank in base, oilite bearings and is furnished



with a ½-hp single or three-phase motor as standard equipment.

It will handle materials up to 8¾ inches square. Saw is equipped with swivel vise, automatic feed system and automatic stop. It takes either 12 or 14-inch blades. Saw speeds are 70 or 125 strokes per mintue.

Check No. 1 on Reply Card for more Details

Speedy Bulk Loader

Model HAH with a ½-cubic yard bucket, front wheel drive and a full-reversing transmission giving four forward and four corresponding but faster reverse speeds is added to the Payloader line by Frank G. Hough

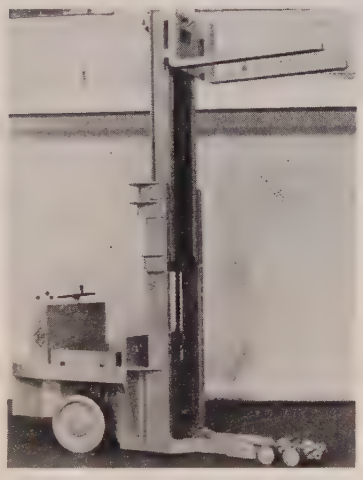
Co., 876 Seventh St., Libertyville, Ill. Forward-to-reverse motion is provided by a separate directional shift independent of the regular gear shift. Top forward is 14 mph and top reverse speed for carrying full loads is 23 mph.

Lifting and lowering and the dumping and closing of the bucket are accomplished by hydraulic rams using fingertip control. Maximum dumping clearance of 7½ feet permits loading big trucks but loads can be dumped at any point of the lift and either slow or fast. Large pneumatic tires on both the driving and the steering wheels allow this model to be used effectively on unpaved ground as well as pavement and floors.

Check No. 2 on Reply Card for more Details

Big Load Capacity

Low truck weight is combined with relatively high load capacity in the electric power industrial truck announced by Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland, O. The basic truck is similar to the company's high-lift platform truck. Load supporting member is attached to the elevating truck mechanism the same



as in platform trucks. In place of a platform two reinforced alloy steel arms or forks extend forward the usual length of a platform. The forward wheels are 6½ inches in diameter and the arms in lowered position come outside and nearly flush with the top of wheels.

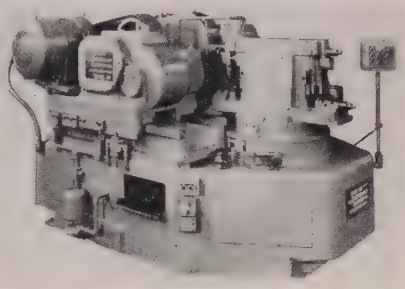
Design of the truck provides for low underclearance in various type skids. For high tiering the truck may be equipped with a fork the tines of which come below the top level of the wheels. Trucks are built in several sizes with load capacities ranging from 4000 to 10,000 pounds.

Check No. 3 on Reply Card for more Details

Two-Station Face Miller

Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, O., announces a duplex milling two-station machine for face milling. A rotary indexing table carries two sets of work-holding fixtures. While the two milling heads are machining the part held at the work point, the operator unloads and loads the open fixture.

Cycle of operation is automatic when the operator presses the cycle button. Table carrying the fixtures and work indexes 180 degrees and is clamped solidly into position. Two opposed milling heads traverse forward, feed to an adjustable stop and



rapid traverse return. Heavy duty milling heads can utilize up to 30 hp and have 2 inches of quill adjustment for cutter wear. Carbide or high speed steel cutters can be used.

Check No. 4 on Reply Card for more Details

Belt Life Doubled

A contact wheel for abrasive belt application on backstand idler application is announced by Carborundum Co., Niagara Falls, N. Y. The "61" contact wheel permits the belt

life to be doubled by reducing glazing to a great degree. Unique characteristics of the wheel are: The relief angle, wide spaced lands, narrowness of the lands, which are based on the design of milling cutters are the developments responsible for the increase in belt life and cutting rates.

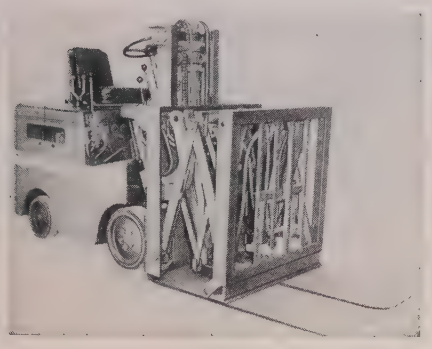
Tests in the company's laboratories show the wheels permitted removal of 2 to 4½ times the total grams removed with the use of other wheels. Belt life was increased from 2 to 5 times and average work life was in-

creased from 1.8 to 5 times and very heat sensitive work life from 1.7 to 3.8 times.

Check No. 5 on Reply Card for more Details

Pul-Pac Use Extended

Pul-Pac and Pusher devices used on larger models are made available for both gas and electric 200-pound capacity Clipper lift trucks made by Clark Equipment Co., Industrial Truck Division, Battle Creek, Mich. Unit loads assembled on relatively in-



expensive carrier sheets rather than on conventional pallets can be pulled onto and pushed off the load carrying plates with the device.

Pusher device, similar to the Pul-Pac except for the gripping mechanism and carrying plates, is used in unloading operations only. Unit loads can be unloaded directly from the forks or from conventional pallets with the Pusher whenever rehandling as a unit is not required.

Check No. 6 on Reply Card for more Details

Variable Speed Tachometer

Motor applications that require continuous and accurate speed indication can be provided with model R-1 tachometer and generator made by U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif., in ratings from ¼ to 50 hp and speeds from 2 to 10,000 rpm. Unit is coupled to motors made by the company and no other source of power is necessary.

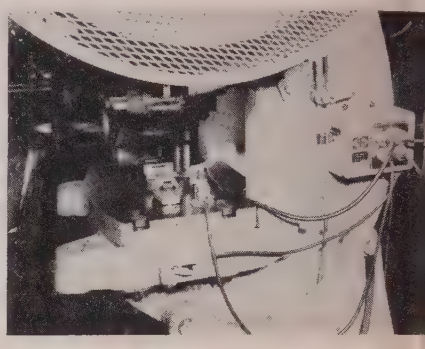
It is entirely enclosed to prevent entrance of dust and other foreign particles and can be mounted at distance up to 300 feet from the Varidrive without having an adverse affect on its accuracy.

Indicator dial shows operating speed as a percentage of maximum speed. For example, if the maximum speed is 1000 rpm and the dial indicates 60 per cent the speed would be 60 per cent of 1000 or 600 rpm. Each unit is supplied with 10 feet of two-conductor cable enabling the tachometer to be mounted in the most advantageous location.

Check No. 7 on Reply Card for more Details

Breakage Reduced

A protective device to safeguard machines, presses, tools and dies and known as the U. S. Multi-Stop is being manufactured by U. S. Tool Co. Inc., Ampere (East Orange), N. J. It will stop a machine automatically at the end of a coil or strip, if stock buckles between unit and die, if thick-



ness of stock varies beyond specified limits, if width of stock varies beyond specified limits or if short feed occurs.

There are four plugs in the control box. In a typical punch press

clothes dryers to deep fryers

wire cloth

FOR HOME APPLIANCES

Whether the wire cloth is to be "standard" . . . or "strictly to specifications" . . . or a tough "start from scratch" new development problem—Reynolds engineers are right at home in the home appliance field. And in other fields—automobiles to aircraft . . . farm harvesters to fly swatters . . . floor furnaces to faucet filters. And for the same reasons—Reynolds' fifty years of fabricating wire, and many, many more years of research measured in engineering man-hours. If you use wire cloth, Reynolds engineers can be helpful. Consult them without cost or obligation.

- Clothes Dryers
- Automatic Washers
- Dishwashers
- Refrigerators
- Home Freezers
- Vacuum Cleaners
- Electric Ventilators
- Dehumidifiers
- Fruit Juicers
- Electric Deep Fryers

REYNOLDS WIRE DIVISION
NATIONAL-STANDARD COMPANY

DIXON, ILLINOIS

NS NATIONAL-STANDARD Company NILES, MICHIGAN

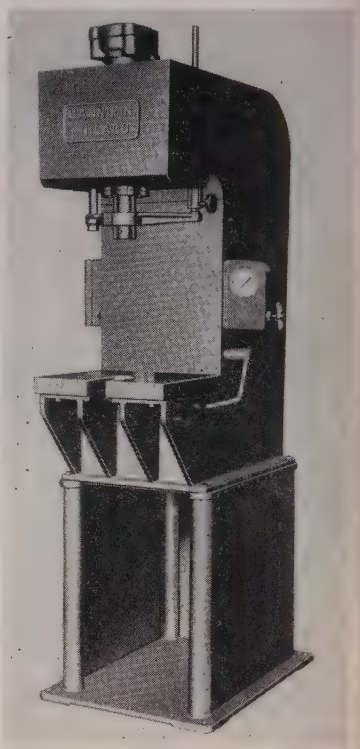
operation where only two switches and plugs are used, the remaining two plugs would be jumper plugs as all are connected in series.

Check No. 8 on Reply Card for more Details

Two Small Presses

Two hydraulic presses, a 5-ton and an 8-ton, are announced by Hannifin Corp., 1124 S. Kilbourn Ave., Chicago 24, Ill. With these models the company has a complete line of small hydraulic presses ranging from 1 to 10 tons. Since they are in continual quantity production, they can usually be supplied on much shorter notice and at lower cost than presses that are built to order. They are offered as complete units with built-in reservoir and with motor and pump mounted inside the frame.

Designated as the F-50A and the F-80 they are also offered with larger motor and pump and consequently higher ram speeds as the F-51 and F-81, respectively. Single manual lever control is standard, but dual manual levers and electric push button control are both available. For repetitive production operations the stroke can be shortened by limiting the return stroke to the point where the ram just clears the work. Also the actual force exerted by the press



can be adjusted anywhere in the range between 10 and 100 per cent maximum capacity so the press will deliver the pressure needed.

Check No. 9 on Reply Card for more Details

Pump Line Expanded

Ball bearing pulley and sprocket drive pumps are added to the line made by Eco Engineering Co., 12 New York Ave., Newark, N. J. Construction of the reversible pump is such that transmission loads are absorbed by the pump housing without being transmitted to the pump shaft bearings.

Pumps are made of naval bronze forgings or stainless steel precision castings with capacities from 1/10 to 19 gpm for use against pressures up to 150 psi. They are available in four sizes: ¼, ⅜, ½ and ¾-inch with speeds from 300 to 3400 rpm. Both types are available with hydraulically balanced built-in bypass and adjustable base.

Check No. 10 on Reply Card for more Details

Induction Heating Generator

Versatile 5-kilowatt radio-frequency generator for industrial applications where relatively small parts are to be surface hardened, annealed, brazed or soldered is available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Unit is designed either for production line op

eration where parts are fed continuously through the heating coil, or for small-lot operation handled on a batch basis. Generator may be used for several kinds of work by changing the heating coil and fixture which attach at the front of top of the unit.

It features stepless electronic power output control, from ½ to 5 kw

providing operating flexibility and uniform performance on repetitive setups. It will deliver 5 kw of radio-frequency power at 100 per cent duty cycle measured by approved NEMA standards.

The generator is portable, easy to install and its load kva is high. An aluminum cabinet provides radio-frequency shielding and electrical interlocks protect personnel.

Check No. 11 on Reply Card for more Details

Better Foundry Sand

Foundry sand that is more flowable, lump free and appreciably cooler results from the use of the Mixer-Muller made by Pekay Machine &

Engineering Co., 100 N. LaSalle St., Chicago 2, Ill. Tests show permeability is increased from 100 to 110, green compression strength is up from 10.5 to 12 pounds, correct moisture content is maintained and use

of bonding material is reduced by half.

Smaller dimensions (normally about 24 feet long by 2 feet high on a 12 to 24-foot conveyor belt) means installation expense is cut to about 100 man-hours. The unit can be installed at practically any point in the existing belt system without major rebuilding and without interference with ventilation.

Check No. 12 on Reply Card for more Details

Explosion-Proof Housing

For use on their electrically operated pilot controlled valves, Ross Operating Valve Co., Detroit 3, Mich., announces a new explosion-proof solenoid housing. The cover which can be used wherever fire and explosion hazards exist, is made of cast aluminum to Underwriters' Laboratory specifications. Provision is made for standard conduit connection.

Check No. 13 on Reply Card for more Details

Gives Chrome-Like Appearance

An extra fine aluminum lining pigment capable of producing films of a chrome-like appearance is announced by Metals Disintegrating Co., Elizabeth, N. J. Known as MD 769 aluminum paste, it provides a degree of improved dispersibility.

Check No. 14 on Reply Card for more Details

Special Hollow Mills

Hollow mills with an outside diameter of ⅝-inch and under are available from Woodruff & Stokes Co. Inc., Hingham, Mass. They are not stock items; each is designed and made to meet customer's requirements. Machined of carbon or high speed steels or special alloys, they may be plain or adjustable, with internal or external steps, for left or right hand screw machine work.

Check No. 15 on Reply Card for more Details

Solvent Recovery Unit

Modine Mfg. Co., Racine, Wis., introduces a new plate type heat exchanger designed for solvent recovery. Incorporating interlocked channel type fins with special embossings or interrupted surfaces, the design provides high concentration of surface for low weight and volume.

Check No. 16 on Reply Card for more Details

Magnetic Holder for Indicators

Erick Magna-Holder for all types of indicators is introduced by Passing Eye Inc., Kenosha, Wis. It can be applied to flat, round or angled ferrous surfaces. Permanent Alnico magnets hold it with a 30-35 pound pull. Universal settings and immediate indicator readings are made possible by nonmagnetic stainless steel indicator holder arm set in ball socket.

Check No. 17 on Reply Card for more Details

Ox Bow Magnet Chain

Two new types of ox bow magnet chains, announced by American Chain Division, American Chain & Cable Co. Inc., York, Pa., were designed for handling materials with electromagnets. Both the 1 and 1¼-inch chains are made entirely from alloy steel and heat treated to 125,000 psi tensile strength.

Check No. 18 on Reply Card for more Details

Lathe Tool Holder

A new tool holder of the universal type is available from South Bend Lathe Works, South Bend, Ind. Known as the 10 in 1 tool holder, it is supplied in five sizes for the adjustment for tool height and comes equipped with self-aligning knurling head and a pair of medium diamond knurls.

Check No. 19 on Reply Card for more Details

Rubber Compound for Seals

Parker Appliance Co., Cleveland, O., announces O-rings and other precision molded seals are available in a newly developed extreme temperature range synthetic rubber compound. Resistant to nonfuel petroleum products such as lubricating oils and hydraulic fluids, Parker 42 functions effectively in sealing performance anywhere in temperature range from minus 85 to plus 275° F.

Check No. 20 on Reply Card for more Details

Hold-Down Clamp

Amiclamp Co., Akron 14, O., introduces a hold-down clamp for use in machine shop or tool room. The heel support of the clamp is rotated to the height of the work, clamp is placed in position and bolted down. The lock between the heel support and clamp eliminates creeping.

Check No. 21 on Reply Card for more Details

Spacing Collars for Cutters

Micrometer adjustable spacing collars, offered by Dayton Rogers Mfg. Co., Minneapolis 7, Minn., make it possible to space all milling machine cutters within one-quarter of 0.001-inch by visual graduating means engraved on the outer micrometer sleeve. Spacing of collars is made by loosening milling machine cutter arbor nut after first trial cut is made. After arbor nut is tightened, collars are designed so that there is no slipping and positive adjustment is assured throughout the production run. Collars are made of a new and improved special alloy steel that will take arbor nut pressure up to and including 25 tons.

Check No. 22 on Reply Card for more Details

Table Truck Carries One Ton

Marforge table truck, made by Market Forge Co., Everett, Mass., has metal frame work that is arc welded throughout and will support up to a ton of weight. The top is 2-inch hard maple, jointed true and glued and has a natural wood finish. It is reinforced with concealed bolts. Table is available with legs or casters and can be furnished with floor locks.

Check No. 23 on Reply Card for more Details

Midget Pneumatic Screwdriver

Desoutter miniature screwdriver and nutrunner M60, available from Newage International Inc., New York 17, N. Y., weighs only 8 ounces. It has a capacity for all screws from No. 1 to No. 8 ANF and ANC and equivalent nuts. Reversing control is built into the head of the tool and makes it suitable for disassembly work.

Check No. 24 on Reply Card for more Details

Hand Push Trolley

A new 6-inch hand push trolley for heavy loads and short radius curves is announced by Jervis B. Webb Co., Detroit, Mich. Two No. 6970 two-wheel trolleys are mounted on a steel load bar in such a manner that they can negotiate a minimum of an 18-inch radius curve. They are adapted only for use on standard 6-inch, 12.5-pound I-beams.

Check No. 25 on Reply Card for more Details

Medium Size Range Solenoid

An electric solenoid made by Practical Electric Co., Melvindale, Mich., is available in three voltage ranges: 110, 220 and 440, with ⅝-inch maximum stroke, and rated pull or push ranging from 4 to 10 pounds against gravity. It is dimensionally interchangeable with standard solenoids.

Check No. 26 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

The Market Outlook

THIRD QUARTER gives promise of being most critical from the standpoint of steel supply. Cutbacks in automotive and other consumer durable goods production are being scheduled because of impending shortening in raw material supplies. Defense and related requirements are slated to take substantially heavier tonnage beginning July. And the amount of "free" steel for unrated consumption is likely to be pitifully small in some products. Certainly, it will fall far short of demands despite sharp cutbacks in production of consumer durable goods. Complicating the situation during the period will be the transition to Controlled Materials Plan distribution. CMP becomes effective July 1 but is not likely to be fully operative until fourth quarter.

SCHEDULING— Steel mill rolling schedules are shaping up rapidly for July. With only a few day's lead-time remaining, most of the mills are lining up their production plans for the month with a sizably heavier burden of defense and defense-support work projected. Some producers already are sufficiently committed for defense tonnage to round out their DO-rated quotas and they are advising civilian consumers as to what tonnage they can expect to get on unrated quotas.

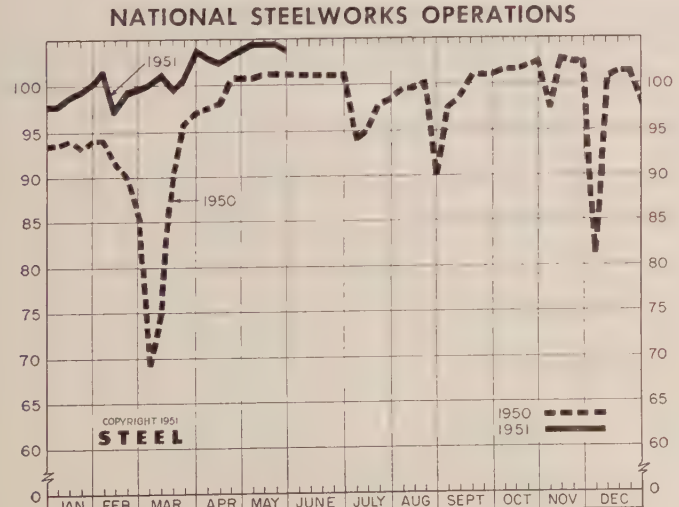
CUTBACKS— Certain government directive programs switched over from an allocation to a strictly DO-rated basis for July and beyond, or until the Controlled Materals Plan becomes fully effective, will receive less tonnage than heretofore. Freight car builders stand to get substantially less, and the tonnage for locomotive builders also will be cut.

CONTROLS—NPA's basic steel order, M-1, again has been amended. Customers of steel converters now are assured sufficient supplies to give them a minimum of 90 per cent of their average monthly base period tonnage. The amendment extends to Canadian converter customers as well. Excluded from the 90 per cent requirement is carbon plate for line pipe. M-1 has been further amended changing the 45 days' lead-time for acceptance of DO orders on July shipments of carbon steel to 30 days. Also, NPA last week amended its regulation 4 adjusting limitations on use of the DO-97 rating for maintenance, repair and operating supply items to compensate for increased prices and accelerated production programs. Under the amended regulation, use of DO-97 is permitted at a rate up to 120 per cent of the rate of expenditure for MRO items during the base period. The limit previously was 100 per cent.

PRODUCTION—Steelmaking operations continue to be pushed at near-record pace. But curtailments for repairs and vacation interruptions loom just ahead. Also raw material shortages are being encountered. Because of the extreme scarcity of nickel, molybdenum, cobalt and columbium NPA has notified producers of alloy and stainless steels not to use these metals in June production for defense rated or directed orders until further notice. This action was taken because melt schedules for May show substantial increases in use of these alloys. For use in non-rated orders, however, nickel producers are directed to supply steelmakers with 15 per cent of their base period receipts while molybdenum producers will furnish 25 per cent. Shortage of pig iron is becoming more severe and talk of allocations is again heard. Shrinking scrap inventories present a serious threat to production over coming months. Last week the national ingot rate slipped ½ point to 103.5 per cent of capacity.

PRICES—Manufacturers of fabricated steel products are submitting data on prices to the Office of Price Stablization under the Manufacturers General Ceiling Price Regulation. Industrial fastener makers are ncluded in the list of those required to file. Basic metals, however, are exempted. Steel prices continue at levels frozen under the general price order of last January. STEEL's weighted index of finished steel prices hold at 171.92 as does the arithmetical price composite at $106.32.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 26	Change	Same Week 1950	Same Week 1949
Pittsburgh	98.5	+ 1.5*	103	94
Chicago	108.5	+ 1	104.5	99
Mid-Atlantic	101.5	0	98	91.5
Youngstown	105	0	107	105
Wheeling	99	- 0.5	108	86
Cleveland	100.5	- 0.5	99.5	104.5
Buffalo	104	0	104	96
Birmingham	100	0	100	100
New England	92	- 1	85	56
Cincinnati	104	+ 3	106	94
St. Louis	99.5	- 3	91	78
Detroit	106	— 1.5*	103	70
Western	103	- 1	94.5	85
Estimated national rate	103.5	— 0.5	101	94.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 39 *Production-Engineering News—p. 75*

Composite Market Averages

	May 24 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)..	171.92	171.92	171.92	156.13	111.62
Index in cents per lb.	4.657	4.657	4.657	4.230	3.024
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.23	63.54
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.47	26.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	25.50
Malleable Pig Iron, GT ...	53.27	53.27	53.27	47.27	26.79
Steelmaking Scrap, GT ...	44.00	44.00	44.00	35.50	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 24 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.20	3.93	2.82
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10–15	3.10
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia ..	3.91	3.91	3.91	3.46	2.465
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh....	3.75–4.00	3.75–4.00	3.75–4.00	3.25	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ...	4.65–5.35	4.65–5.35	4.65–5.35	4.15	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35–5.60	4.35–5.60	4.35–5.60	4.35–40	3.15
Wire, Basic, Pittsburgh....	4.85–5.10	4.85–5.10	4.85–5.10	4.50	3.05
Nails, Wire, Pittsburgh ...	5.90–6.20	5.90–6.20	5.90–2.20	5.30	3.25
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ⅜-⅝", Pitts. ..	4.10–30	4.10–30	4.10–30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$27.00
Basic Valley	52.00	52.00	52.00	46.00	26.00
Basic, del. Phila.	56.49	56.49	56.49	49.44	27.84
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Del. Phila. ...	56.99	56.99	56.99	49.94	28.34
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.88
No. 2 Fdry (Birm.)del. Cin.	55.33	55.33	55.33	49.08	26.94
Malleable Valley	52.50	52.50	52.50	46.50	26.50
Malleable, Chicago	52.50	52.50	52.50	46.50	26.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts..	$45.00	$45.00	$45.00	$39.00	$20.00
No. 1 Heavy Melt. E. Pa..	43.50	43.50	43.50	32.50	18.75
No. 1 Heavy Melt. Chicago	43.50	43.50	43.50	35.00	18.75
No. 1 Heavy Melt. Valley..	45.00	45.00	45.00	38.75	20.00
No. 1 Heavy Melt. Cleve. .	44.00	44.00	44.00	35.25	19.50
No. 1 Heavy Melt. Buffalo.	44.00	44.00	44.00	34.50	19.25
Rails, Rerolling, Chicago..	52.50	52.50	52.50	49.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	46.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn., Connlsvl..	$14.75	$14.75	$14.75	$14.25	$7.50
Beehive, Fdry., Connlsvl...	17.50	17.50	17.50	15.50	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	20.50	12.00
Zinc, E. St. Louis.....	17.50	17.50	17.50	12.50	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York 139.00	139.00	142.00	78.50	52.00	
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid.	50.50	50.50	50.50	40.00	35.00

Pig Iron

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn,N.Y.,del.	....	58.69	59.46	....
Newark,del.	56.74	57.24	57.74	58.24
Philadelphia,del.	56.49	56.99	57.49	57.99
Birmingham District				
AlabamaCity,Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward,Ala. W15	48.38	48.88	....	....
Cincinnati,del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda,N.Y. W12	52.00	52.50	53.00	....
No.Tonawanda,N.Y. T9	....	52.50	53.00	....
Boston,del.	61.63	62.13	62.63	....
Rochester,N.Y.,del.	54.74	55.24	55.74	....
Syracuse,N.Y.,del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00	....	52.50	....
IndianaHarbor,Ind. I-2	52.00	....	52.50	....
So.Chicago,Ill. W14	52.00	52.50	52.50	....
So.Chicago,Ill. Y1	52.00	52.50	52.50	....
So.Chicago,Ill. U5	52.00	....	52.50	53.00
Milwaukee,del.	53.97	54.47	54.47	54.97
Muskegon,Mich.,del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain,O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett,Mass. E1	....	51.75	52.25	....
Fontana,Calif. K1	58.00	58.50	....	....
Geneva,Utah G1	52.00	52.50	....	....
Seattle, Tacoma,Wash.,del.	....	60.35	....	....
Portland,Oreg.,del.	....	60.35	....	....
LosAngeles,SanFrancisco,del.	59.85	60.35	....	....
GraniteCity,Ill. G4	53.90	54.40	54.90	....
St.Louis,del. (inc. tax)	54.66	55.16	55.66	....
Ironton,Utah C11	52.00	52.50	....	....
LoneStar,Tex. L6	48.00	*48.50	48.50	....
Minnequa,Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	52.50	52.50	53.00
Pitts.,N.&S. sides, Ambridge, Aliquippa,del.	....	53.74	53.74	54.24
McKeesRocks,del.	....	53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport,Monaca,del.	....	54.00	54.00	54.50
Verona,del.	....	54.48	54.48	54.98
Brackenridge,del.	....	54.72	54.72	55.22
Bessemer,Pa. U5	52.00	....	52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00	....	....	....
McKeesport,Pa. N3	52.00	....	....	53.00
Monessen,Pa. P7	54.00	....	....	....
Sharpsville,Pa. S6	....	....	52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati,del.	57.21	57.71	....	....
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield,O.,del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SIVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls,N.Y. P15	$83.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2.....	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia delivered	63.12
Troy,N.Y. R2	60.00

Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, May 24, 1951; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicat e producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana, Calif. K1 ...$79.00
Munhall, Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana, Calif. K1 ....80.00
Houston, Tex. S5 ....62.00
Midland, Pa. C18 ....54.00
Munhall, Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer, Pa. U5 ....$56.00
Clairton, Pa. U5 .....56.00
Ensley, Ala. T2 .....56.00
Fairfield, Ala. T2 .....56.00
Fontana, Calif. K1 ....75.00
Gary, Ind. U5 .....56.00
Johnstown, Pa. B2 ....56.00
Lackawanna, N.Y. B2 ..56.00
Munhall, Pa. U5 .....56.00
So. Chicago, Ill. U5 ....56.00
So. Duquesne, Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer, Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton, O. R2 .....66.00
Clairton, Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken, Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley, Ala. T2 .....66.00
Fairfield, Ala. T2 .....66.00
Fontana, Calif. K1 ....85.00
Gary, Ind. U5 .....66.00
Geneva, Utah G1 .....66.00
Houston, Tex. S5 .....74.00
Johnstown, Pa. B2 ....66.00
Lackawanna, N.Y. B2..66.00
Los Angeles B3 .....85.00
Munhall, Pa. U5 .....66.00
Seattle B3 .....85.00
So. Chicago R2, U5, W14 .66.00
So. Duquesne, Pa. U5 ...66.00
So. San Francisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem, Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton, O. R2 .....70.00
Canton, O. (29) T7 ....66.00
Conshohocken, Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana, Calif. K1 ....89.00
Gary, Ind. U5 .....70.00
Houston, Tex. S5 .....78.00
Ind. Harbor, Ind. Y1 ...70.00
Johnstown, Pa. B2 ....70.00
Lackawanna, N.Y. B2..70.00
Los Angeles B3 .....90.00
Massillon, O. R2 .....70.00
Midland, Pa. C18 .....70.00
Munhall, Pa. U5 .....70.00
So. Chicago R2, U5, W14 .70.00
So. Duquesne, Pa. U5 ...70.00
Struthers, O. Y1 .....70.00
Warren, O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton, O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana, Calif. K1 ....103.00
Gary, Ind. U5 .....82.00
Massillon, O. R2 .....82.00
So. Chicago, Ill. R2 ....82.00
So. Duquesne, Pa. U5 ..82.00

SHEET BARS (NT)
Fontana, Calif. K1 ...$89.00

SKELP
Aliquippa, Pa. J5 .....3.45
Munhall, Pa. U5 .....3.35
Warren, O. R2 .....3.35
Youngstown R2, U5 ...3.35

WIRE RODS
Alabama City, Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora, Pa. A7 .....4.10
Fairfield, Ala. T2 .....4.10
Fontana, Calif. K1 ....4.90
Houston, Tex. S5 .....4.50
Johnstown, Pa. B2 .....4.10
Joliet, Ill. A7 .....4.10
Los Angeles B3 .....4.90
Minnequa, Colo. C10 ....4.35
Monessen, Pa. P7 .....4.30
No. Tonawanda, N.Y. B11 4.10
Pittsburg, Calif. C11 ....4.75
Portsmouth, O. P12 ....4.30
Roebling, N.J. R5 .....4.20
So. Chicago, Ill. R2 ....4.10
Sparrows Point, Md. B2 ..4.20
Sterling, Ill (1) N15 ....4.10
Struthers, O. Y1 .....4.10
Torrance, Calif. C11 ....4.90
Worcester A7 .....4.40

PLATES, Wrought Iron
Economy, Pa. B14 .....8.60

STRUCTURALS
Carbon Steel Stand. Shapes
Alabama City, Ala. R2 ..3.60
Aliquippa, Pa. J5 .....3.65
Bessemer, Ala. T2 .....3.65
Bethlehem, Pa. B2 .....3.70
Clairton, Pa. U5 .....3.65
Fairfield, Ala. T2 .....3.65
Fontana, Calif. K1 .....4.25
Gary, Ind. U5 .....3.65
Geneva, Utah G1 .....3.65
Houston, Tex. S5 .....4.05
Ind. Harbor, Ind. I-2 ....3.65
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 ....4.25
Lackawanna, N.Y. B2 ..3.70
Los Angeles B3 .....4.25
Minnequa, Colo. C10 ....4.10
Munhall, Pa. U5 .....3.65
Niles, Calif. (22) P1 ....4.85
Phoenixville, Pa. P4 ....4.95
Portland, Oreg. O4 .....4.50
Seattle B3 .....4.30
So. Chicago, Ill. U5, W14 .3.65
So. San Francisco B3 ....4.20
Torrance, Calif. C11 ....4.25
Weirton, W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton, Pa. U5 .....4.35
Fontana, Calif. K1 ....5.55
Munhall, Pa. U5 .....4.35
So. Chicago, Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa, Pa. J5 .....5.50
Bessemer, Ala. T2 .....5.50
Bethlehem, Pa. (14) B2 ..5.50
Clairton, Pa. U5 .....5.50
Fairfield, Ala. T2 .....5.50
Fontana, Calif. K1 .....6.10
Gary, Ind. U5 .....5.50
Geneva, Utah G1 .....5.50
Ind. Harbor, Ind. I-2 ....5.50
Ind. Harbor, Ind. Y1 ....6.00
Johnstown, Pa. B2 .....5.50
Lackawanna, N.Y. (14) B2 5.50
Los Angeles B3 .....6.05
Munhall, Pa. U5 .....5.50
Seattle B3 .....6.10
So. Chicago, Ill. U5 ....5.50
So. San Francisco B3 ....6.00
Struthers, O. Y1 .....6.00

Wide Flange
Bethlehem, Pa. B2 .....3.70
Clairton, Pa. U5 .....3.65
Fontana, Calif. K1 .....4.65
Lackawanna, N.Y. B2 ...3.70
Munhall, Pa. U5 .....3.65
So. Chicago, Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 .....5.50
Lackawanna, N.Y. B2 ..5.50
Munhall, Pa. U5 .....5.45
So. Chicago, Ill. U5 ....5.45

SHEET STEEL PILING
Ind. Harbor, Ind. I-2 ....4.45
Lackawanna, N.Y. B2 ..4.45
Munhall, Pa. U5 .....4.45
So. Chicago, Ill. U5 ....4.45

BEARING PILES
Munhall, Pa. U5 .....3.65
So. Chicago, Ill. U5 .....3.65

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 .....5.65
Bessemer, Ala. T2 .....5.65
Clairton, Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken, Pa. A3 ..5.90
Fairfield, Ala. T2 .....5.65
Fontana, Calif. (30) K1 ..6.25
Gary, Ind. U5 .....5.65
Geneva, Utah G1 .....5.65
Ind. Harbor, Ind. I-2 ....5.65
Ind. Harbor, Ind. Y1 ....6.15
Johnstown, Pa. B2 .....5.65
Munhall, Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon, Pa. S3 .....5.70
So. Chicago, Ill. U5 .....5.65
Sparrows Point, Md. B2 ..5.65
Warren, O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont, Del. C22 ....4.85
Coatesville, Pa. L7 ....5.25
Conshohocken, Pa. A3 ..5.05
Fontana, Calif. K1 .....5.70
Gary, Ind. U5 .....4.75
Johnstown, Pa. B2 .....4.75
Munhall, Pa. U5 .....4.75
Sharon, Pa. S3 .....5.20
So. Chicago, Ill. U5 .....4.75
Sparrows Point, Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken, Pa. A3 ..4.75
Harrisburg, Pa. C5 .....5.95
Ind. Harbor, Ind. I-2 ....4.75
Munhall, Pa. U5 .....4.75
So. Chicago, Ill. U5 ....4.75

PLATES, Carbon Steel
Alabama City, Ala. R2 ..3.70
Aliquippa, Pa. J5 .....3.70
Ashland, Ky (15) A10 ..3.70
Bessemer, Ala. T2 .....3.70
Clairton, Pa. U5 .....3.70
Claymont, Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville, Pa. L7 ....4.15
Conshohocken, Pa. A3 ..4.15
Fairfield, Ala. T2 .....3.70
Fontana, Calif. (30) K1 ..4.30
Gary, Ind. U5 .....3.70
Granite City, Ill. G4 ....4.40
Geneva, Utah G1 .....3.70
Harrisburg, Pa. C5 .....4.95
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2, Y1 .3.70
Johnstown, Pa. B2 .....3.70
Lackawanna, N.Y. B2 ..3.70
Minnequa, Colo. C10 ....4.50
Munhall, Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon, Pa. S3 .....3.95
So. Chicago, Ill. U5, W14 .3.70
Sparrows Point, Md. B2 ..3.70
Steubenville, O. W10 ....3.70
Warren, O. R2 .....3.70
Weirton, W.Va. W6 ....4.00
Youngstown R2, U5, Y1 .3.70

PLATES, Carbon A. R.
Fontana, Calif. K1 ....5.45
Geneva, Utah G1 .....4.85

PLATES, Ingot Iron
Ashland, c.l. (15) A10 ...3.95
Ashland, lcl (15) A10 ...4.45
Cleveland, c.l. R2 .....4.30
Warren, O. c.l. R2 .....4.30

BARS, Hot-Rolled Carbon
Alabama City, Ala. R2 ..3.70
Aliquippa, Pa. J5 .....3.70
Alton, Ill. (1) L1 .....3.95
Atlanta, Ga. A11 .....4.25
Bessemer, Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton, O. R2 .....3.70
Clairton, Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville, Calif. J7 ....4.45
Fairfield, Ala. T2 .....3.70
Fontana, Calif. K1 ....4.40
Gary, Ind. U5 .....3.70
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2, Y1 .3.70
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 ....4.30
Lackawanna, N.Y. B2 ..3.70
Los Angeles B3 .....4.40
Milton, Pa. B6 .....4.20
Minnequa, Colo. C10 ....4.15
Niles, Calif. P1 .....5.05
N. Tonawanda, N.Y. B11 .3.70
Pittsburg, Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland, Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So. Chicago R2, U5, W14 .3.70
So. Duquesne, Pa. U5 ....3.70
So. San Fran., Cal. B3 ...4.45
Struthers, O. Y1 .....3.70
Torrance, Calif. C11 ....4.40
Weirton, W. Va. W6 ....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa, Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown, Pa. B2 .....3.70
Lackawanna, N.Y. B2 ..3.70
Niles, Calif. P1 .....5.05
Portland, Oreg. O4 .....4.65
San Francisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem, Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton, O. R2 .....4.30
Canton, O. (29) T7 .....3.95
Clairton, Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse, Mich. G5 .....4.65
Fontana, Calif. K1 .....5.35
Gary, Ind. U5 .....4.30
Houston, Tex. S5 .....4.70
Ind. Harbor, Ind. I-2, Y1 .4.30
Johnstown, Pa. B2 .....4.30
Kansas City, Mo. S5 ....4.90
Lackawanna, N.Y. B2 ..4.30
Los Angeles B3 .....5.35
Massillon, O. R2 .....4.30
Midland, Pa. C18 .....4.30
So. Chicago R2, U5, W14 .4.30
So. Duquesne, Pa. U5 ....4.30
Struthers, O. Y1 .....4.30
Warren, O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton, Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa, Pa. J5 .....5.55
Bessemer, Ala. T2 .....5.55
Bethlehem, Pa. B2 .....5.55
Clairton, Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield, Ala. T2 .....5.55
Fontana, Calif. K1 .....6.60
Gary, Ind. U5 .....5.55
Ind. Harbor, Ind. I-2 ....5.55
Indiana Harbor, Ind. Y1..6.05
Johnstown, Pa. B2 .....5.55
Lackawanna, N.Y. B2 ...5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So. Duquesne, Pa. U5 ...5.55
So. San Francisco B3 ...6.30
Struthers, O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge, Pa. W18 ....4.55
Beaver Falls, Pa. M12, R2 .4.55
Buffalo B5 .....4.60
Camden, N.J. P13 .....5.00
Carnegie, Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora, Pa. A7 .....4.55
Elyria, O. W8 .....4.55
Franklin Park, Ill. N5 ...4.55
Gary, Ind. R2 .....4.55
Green Bay, Wis. F7 .....4.55
Hammond, Ind. L2, M13 .4.55
Hartford, Conn. R2 ....5.10
Harvey, Ill. B5 .....4.55
Los Angeles R2 .....6.00
Mansfield, Mass. B5 ....5.10
Massillon, O. R2, R8 ....4.55
Monaca, Pa. S17 .....4.55
Newark, N.J. W18 .....5.00
Plymouth, Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam, Conn. W18 ....5.10
Readville, Mass. C14 ....5.10
St. Louis, Mo. M5 .....4.95
So. Chicago, Ill. W14 ....4.55
Spring City, Pa. (5) K3 ...5.00
Struthers, O. Y1 .....4.55
Waukegan, Ill. A7 .....4.55
Youngstown F3, Y1 ...4.55

BARS, Cold-Finished Alloy
Ambridge, Pa. W18 ....5.40
Beaver Falls, Pa. M12 ...5.40
Bethlehem, Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden, N.J. P13 .....5.80
Canton, O. R2 .....5.40
Canton, O. (29) T7 .....4.90
Carnegie, Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora, Pa. A7 .....5.45
Elyria, O. W8 .....5.40
Gary, Ind. R2 .....5.40
Hammond, Ind. L2, M13 .5.40
Hartford, Conn. R2 ....5.85
Harvey, Ill. B5 .....5.40
Lackawanna, N.Y. B2 ..5.40
Mansfield, Mass. B5 ....5.85
Massillon, O. R2, R8 ...5.40
Midland, Pa. C18 .....5.40
Monaca, Pa. S17 .....5.40
Newark, N.J. W18 .....5.75
Plymouth, Mich. P5 ....5.60
So. Chicago, Ill. R2, W14 .5.40
Struthers, O. Y1 .....5.40
Warren, O. C17 .....5.40
Waukegan, Ill. A7 .....5.45
Worcester, Mass. A7 ...5.75
Youngstown F3, Y1 ...5.40

RAIL STEEL BARS
Chicago Hts. (3,4) I-2, C2 .4.75
Franklin, Pa. (3, 4) F5 ..4.75
Fort Worth, Tex. (26) T4 ..4.85
Huntngtn, W.Va. (3) W7 .5.50
Marion, O. (3) P11 .....4.75
Moline, Ill. (3) R2 .....3.80
Tonawanda (3,4) B12 ...4.75
Williamsport (3) S19 ...5.00
Williamsport (4) S19 ...5.10

BARS, Wrought Iron
Dover, N.J. (Staybolt) U1 15.00
Dover, (Eng. Bolt) U1 ..13.50
Dover (Wrgt. Iron) U1 ..12.25
Economy, Pa. (S.R.) B14 .9.60
Economy, Pa. (D.R.) B14 11.90
Economy, (Staybolt) B14 12.20
McK. Rks. (Staybolt) L5..14.50
McK. Rks. (S.R.) L5 ...9.60
McK. Rks. (D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
Alabama City, Ala. R2 ..3.70
Alton, Ill. (6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville, Calif. J7 ...4.45
Fairfield, Ala. T2 .....3.70
Fontana, Calif. K1 .....4.40
Gary, Ind. U5 .....3.70
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2, Y1 .3.70
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 ....4.30
Lackawanna, N.Y. B2 ...3.70
Los Angeles B3 .....4.40
Milton, Pa. B6 .....4.20
Minnequa, Colo. C10 ....4.50
Niles, Calif. P1 .....5.05
Pittsburg, Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland, Oreg. O4 .....4.65
Sand Springs, Okla. S5 ..4.60
Seattle B3, N14 .....4.45
So. Chicago, Ill. R2 .....3.70
So. Duquesne, Pa. U5 ...3.70
So. San Francisco B3 ...4.45
Sparrows Point, Md. B2 ..3.70
Struthers, O. Y1 .....3.70
Torrance, Calif. C11 ....4.40
Youngstown R2, U5 ...3.70

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington, W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ..4.75
Los Angeles B3 .....5.45
Marion, O. P11 .....5.00
Seattle B3, N14 .....5.55
So. San Francisco B3 ....5.45
Sparrows Pt. ¼-1" B2..4.75
Williamsport, Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
Alabama City, Ala. R2 ..3.60
Ashland, Ky. (8) A10 ..3.60
Butler, Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken, Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse, Mich. (8) G5 ....3.80
Fairfield, Ala. T2 .....3.60
Fontana, Calif. K1 .....4.55
Gary, Ind. U5 .....3.60
Geneva, Utah G1 .....3.70
Granite City, Ill. G4 ....4.30
Ind. Harbor, Ind. I-2, Y-1 .3.60
Irvin, Pa. U5 .....3.60
Lackawanna, N.Y. B2 ..3.60
Munhall, Pa. U5 .....3.60
Niles, O. N12 .....5.25
Pittsburg, Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon, Pa. S3 .....4.00
So. Chicago, Ill. W14 ...3.60
Sparrows Point, Md. B2 ..3.60
Steubenville, O. W10 ....3.60
Torrance, Calif. C11 ....4.30
Warren, O. R2 .....3.60
Weirton, W.Va. W6 ....3.60
West Leechburg, Pa. A4..3.75
Youngstown U5, Y1 ...3.60

SHEETS, H.R., (19 gage)
Alabama City, Ala. R2 ..4.75
Dover, O. R1 .....5.65
Ind. Harbor, Ind. I-2 ....5.40
Mansfield, O. E6 .....5.65
Niles, O. N12 .....5.75
Torrance, Calif. C11 ....5.40

SHEETS, H.R. (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken, Pa. A3 ..5.65
Ecorse, Mich. G5 .....5.95
Fairfield, Ala. T2 .....5.40
Fontana, Calif. K1 ....6.35
Gary, Ind. U5 .....5.40
Ind. Harbor, Ind. I-2 ....5.40
Indiana Harbor, Ind. Y1..5.90
Irvin, Pa. U5 .....5.40
Lackawanna (35) B2 ..5.40
Pittsburgh J5 .....5.40
Sharon, Pa. S3 .....5.40
So. Chicago, Ill. U5 .....5.40
Sparrows Point (36) B2 ..5.40
Warren, O. R2 .....5.40
Weirton, W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse, Mich. G5 .....7.10
Fontana, Calif. K1 .....7.50
Gary, Ind. U5 .....6.55
Indiana Harbor, Ind. Y1 .7.05
Indiana Harbor, Ind. I-2, .6.55
Irvin, Pa. U5 .....6.55
Lackawanna (37) B2 ...6.55
Pittsburgh J5 .....6.55
Sparrows Point (38) B2 ..6.55
Warren, O. R2 .....6.55
Weirton, W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana, Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala T2.	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville, O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt.Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain (10) S15	4.00
NoTonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10) S15	10.75
Pawtucket,R.I.(11) N8	10.75
Pawtucket,R.I.(12) N8	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt,Conn.(10)	S15 5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.85
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork, W3	...	...	10.30	12.50	15.35

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

TRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
Sparrows Pt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE, (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria, O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	8.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers, O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet, Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-Sga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR For Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So. Chicago,Ill. R2	126
Sterling,Ill.(1) N15	180

FENCE POSTS Col.

ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed Col.

AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburgh,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W18	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c,finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	27.50	77.00
304	25.00	28.00–29.50	....	....	20.75–24.50	27.50	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	31.50–34.00	....	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....	....
318	38.50	38.00	....	....	....	....	....
321	26.50	31.00	....	....	23.00	33.00	111.00
347	27.50	30.50–32.00	....	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.25	44.25	41.00	54.00	....	....	....
Inconel	41.00	53.50	....	....	....	....	165.00
Monel	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ⅝-in. 18.5
- ¾-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, al diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fiting-Up bolts 31

NUTS

	Reg.	Heavy
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅝-in.	12	6.5
¾-in.-1½-in.	9	1
1⅝ in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
⅞-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes ...31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. .. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. ... 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger.... 16
N.F. thread, all diams... 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4.5⅛	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON

40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.00	36.50	31.25
303...	43.00	40.00	33.75
304...	43.00	38.50	32.75
309...	55.50	54.50	44.25
316...	56.50	58.50	48.75
321...	49.00	48.00	36.75
347...	53.50	52.00	41.25
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.
Cleveland, strip A7.
Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip C18.
McKeesport, Pa., bars, sheets except Type 416 U5.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.
Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip, except Types 303, 3099, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia.$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid. metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots..	16.00
Swedish, c.l.f. New York, in bags	...7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns	..83.00-148.00
Aluminum: Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	.....51.25-60.00
Phosphor-Copper, 10 tons	50.00
Copper: Electrolytic	43.25
Reduced	.....33.75-37.00
Lead	.....25.50
Magnesium	.....75.00-85.00
Manganese: Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainles Steel, 302	.. 83.00
Zinc, 10-ton lots	.23.00-30.50

Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over	4.00
Less than 1000 lb	.. 4.15
98.8% minus 65 mesh, freight allowed: 1000 lb. and over	... 4.15
less than 1000 lb.	.. 4.25
Molybdenum: 99%, minus 80 to 200 mesh, over 500 lb.	..... 2.85
200 to 500 lb.	.... 3.10
less than 200 lb.	.. 3.25
Chromium, electrolytic 99% Cr min.	..... 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur. ..$14.50-15.00
Connelsvll,fdry. .17.00-18.00
New River, foundry...21.30
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.75
Everett, Mass., ovens New England, del..*24.80
Chicago, ovens 23.00
Chicago, del. 24.40
Terre Haute, ovens....22.50
Milwaukee, ovens 23.75
Indianapolis, ovens ...22.75
Chicago, del. 26.28
Cincinnati, del. 25.73
Detroit, del. 26.71
Ironton, O., ovens 22.50
Cincinnati, del. 25.12
Painesvile, O., ovens..24.00
Cleveland, del. 25.75
Erie, Pa., ovens 23.50
Birmingham, ovens ...20.30
Birmingham, del. ...21.69
Philadelphia, ovens ...22.70
NevilleIsland,Pa.,ovens 23.00
Swedeland, Pa., ovens..22.60
St. Louis, ovens
St. Louis, del. 25.40
Portsmouth, O., ovens..22.50
Cincinnati, del. 25.12
Detroit, ovens 24.00
Detroit, del. 25.00
Buffalo, del. 26.75
Flint, del. 26.49
Pontiac, del. 25.42
Saginaw, del. 26.81

* Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try) .	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try) ..	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va..	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse) .	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.) ..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††[5]	6.00	6.25	7.55
Buffalo (w'hse).	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††[5]	5.80	6.05	7.35
Pitts. (w'hse)..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse).	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse) .	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city) ..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city) .	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try).	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.).	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse) .	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm,(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[3]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)..	6.35	7.90	8.85[3]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco..	6.65	7.80[4]	8.90[3]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma.	7.05	8.60[3]	9.20[3]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basis 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign woiframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
45% no ratio	20.00
48% no ratio	34.00-35.00
50% no ratio	28.00-28.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W 2000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced; (W 98.8% min.) 1000 lb or more, $6.00 per lb of contained W; less than 1000 lb W, $6.15.

**Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.*

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

Note: Current prices on manganese, titanium and chromium alloys appeared on page 151, May 21 issue; silicon, boron and tungsten alloys, page 151, May 14. Refractories prices also were published on page 151, May 14.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

May 24	$44.00
May 17	44.00
Apr. 1951	44.00
May 1950	33.82
May 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches.	Base
10. Flues, Tubes & Pipes.	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under.	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.
(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:
(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:
(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, Tex., 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, W. Va., 70c.
Youngstown, 75c.

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.50
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd	33.00
Bushelings new factory, unprep'd	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

The Metal Market

Members of American Zinc Institute and Lead Industries Association advised to expect more acute materials shortages and tighter government controls. Pressure on prices sustained

MATERIALS shortages will become more acute in months ahead and controls will be tightened. Upward pressure on price structure of the nonferrous metal markets will be sustained. These opinions were expressed by speakers at the annual meetings of Lead Industries Association in New York, May 17-18, and of Zinc American Zinc Institute in St. Louis, May 21-22.

Lead Industries Association members want a more realistic relationship between United States ceiling prices for lead and the higher world prices. They propose periodic adjustment of quotations by the government during the emergency. Suspension of import lead tariffs for two years also was recommended with the provision that should the market drop below 17.00c a pound for 30 days the tariffs be restored.

Order M-9 will be amended soon to create a set-aside of 20 per cent of anticipated production of special high grade zinc and 10 per cent of other grades for defense orders. In addition, 5 per cent is to be held in reserve subject to direction by NPA. Order M-15 will be amended, limiting consumers of special high grade to 70 per cent of their base period usage; base period use of other grades is to be fixed at 80 per cent. Consumer inventories will be limited to a 30-day supply.

Bonus Payments—Defense Minerals Administration is planning an incentive program for lead, including a flat premium for production in excess of established quotas. The incentive plan for zinc contemplates a bonus of 4.00 cents a pound for new production and production in excess of the average annual production rate of a mine.

Otto Herres, chief, Lead-Zinc Branch, DMA, said the world shortage of zinc probably will last for two or three years, "if demand continues to be very heavy and to increase as predicted. . . . Supply can be brought into line with requirements by 1953 by increasing production through the use of an incentive bonus payment . . ., expansion of the industry by tax relief through accelerated amortization, and exploration assistance to develop new ore reserves."

Unless government agencies take prompt action to offset obstructions which current controls have placed against the normal flow of copper, zinc and scrap, and the present prospects with respect to them improve substantially, the output rate of the brass mills in 1950 cannot be sustained this year, said T. E. Veltfort, manager, Copper & Brass Research Association. There will not be as great production of galvanized articles in 1951 as in 1950 due to present shortages and government controls, said Nelson E. Cook, general superintendent of galvanizing, Wheeling Steel Corp., and recipient of the annual award of the Galvanizers Committee.

Battery Shortage — Manufacturers of batteries are especially hampered by the lead shortage and they claim order M-38 is discriminatory and unfair to their industry. A shortage of 9,704,000 automotive battery units this year is indicated for replacement and new vehicles. Total 1951 requirements are estimated at 32,382,000 batteries, but production will be limited to 22,678,000 units. A pending amendment to M-38 will provide for a contingency reserve of 5 per cent of all refiners' monthly output to be set aside for the Tin, Lead & Zinc Division, NPA.

Russel B. Caples, manager, Anaconda Copper Mining Co.'s operations at Great Falls, Mont., succeeds Edward H. Snyder as president of American Zinc Institute. D. Carus, Matthiessen & Hegeler Zinc Co., La Salle, Ill.; A. Elmer Isern, Eagle-Picher Mining & Smelting Co., Miami, Okla.; and G. Howard LeFevre, U. S. Smelting, Refining & Mining Co., New York, were elected vice presidents. Erle V. Daveler, American Zinc, Lead & Smelting Co., New York, was re-elected treasurer. Ernest V. Gent continues as executive vice president and secretary.

Apex Defers Expansion Plans

Apex Smelting Co., Chicago and Cleveland, will not participate in the government's current primary aluminum expansion program. The company could not reach an agreement with the government on a price for the product which would justify building the necessary plants. The accelerated amortization assistance offered by the government, in the case of Apex, would still leave it in an adverse competitive position.

Lifts Limits on DO Orders

Limitations on acceptance of defense rated orders for July shipment by producers of copper and copper-base alloy products will be increased sharply. Ceiling on acceptance by nonferrous foundries of DO orders for beryllium copper castings will be increased to 90 per cent of the total shipments in the first three months of 1951, and all other castings to 75 per cent of the same period.

Producers of foundry copper and copper-base alloy products will be required to accept DO orders for shipment in any one month, beginning in July, of not more than 75 per cent of their average monthly shipments during the first quarter of 1951, but unless otherwise directed by NPA, will not be required to reschedule any DO orders already scheduled.

Order M-11 will be amended to make the first quarter of 1951 the base period for brass mill and wire mill products.

Limitations on acceptance of rated orders by brass mills range from 20 per cent on S. P. S. pipe and type B tube and 50 per cent on alloy seamless tube and beryllium copper tubing to 115 per cent on alloy fourdriner wire. Total tonnage limitation for DO orders on brass mill products is placed at 75 per cent of the tonnage required to fill such orders during the base period.

Limitation for acceptance of DO orders for wire mill products for July shipment is 80 per cent of average monthly shipments in first quarter of 1951.

Export Tin Plate Quota Up

Quota of 1150 long tons of pig tin for production of export tin plate was established for the third quarter by the Office of International Trade. This represents an increase of 150 tons over the second quarter quota. It is estimated that the 1150 tons of pig tin will produce about 124,960 net tons of tin plate for export. This quantity of tin plate for third-quarter production by the mills is distributed as follows: 51,750 tons for European areas, 29,360 tons for Latin American areas, 20,000 tons for Near East and African areas, 13,700 tons for Australia and New Zealand, 9450 tons for Far East areas, and 700 tons for contingencies. Largest allocation was to the Netherlands, followed by those to Australia; Brazil; Union of South Africa; Denmark; Argentina; Algeria, French Morocco and Tunisia; Norway; Italy; and Portugal.

Brass Mills Await Price Order

Watch for establishment of dollars-and-cents ceiling prices on brass mill products. Ceilings will be based on last autumn's prices modified in some respects to reflect increases since then in costs of tin, nickel and other constitutent metals. These products are now under GCPR.

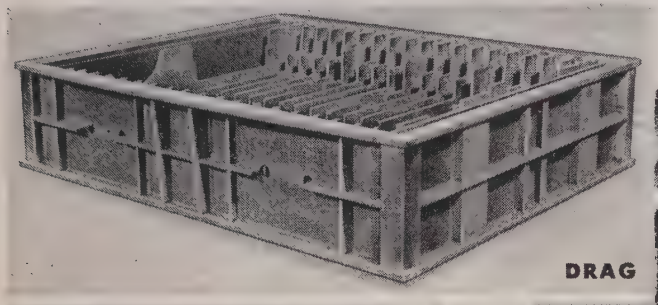
The brass mill industry's inventory of melting copper, refinery shapes, brass scrap, and zinc are 37 to 64 per cent lower than on Jan. 1. One industry representative says his mill never has more than seven days' supply. Diminished volume of copper scrap has hit refinery production and is affecting brass mills and foundries.

OPS Warns Violators of GCPR

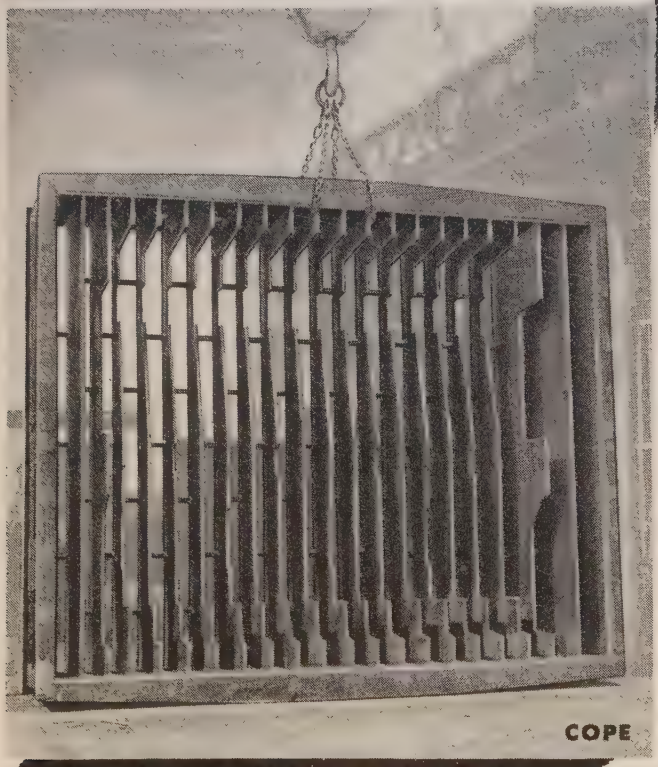
OPS reminds scrap dealers that their transactions are governed by the general price freeze of Jan. 26 and promises vigorous enforcement action against violators of General Ceiling Price Regulation. Edward P. Morgan, director of enforcement, cited the nonferrous metal industry as an example of GCPR violation. He pointed out dealers have had ample time to become thoroughly familiar with the regulation and should have clearly established their ceilings. Those who do not observe them are inviting court proceedings, he added.

this is no double-talk . . .

GRAVER WELDMENTS are used to make CASTINGS!



DRAG



COPE

Shown above are welded cope and drag. Due to massive size of flask, handles were eliminated to allow for clearance in shipping and were later installed by customer.

It may sound odd to mention weldments and castings in the same breath . . . *but* a nationally-known foundry is using a *welded* foundry flask—fabricated by Graver—to *cast* cylinder blocks for diesel engines.

This flask was made as a *weldment* because: (1) A casting would require a more complex and heavier construction. (2) The structural strength was increased due to the more advantageous physical properties of rolled steel. (3) A weldment lends itself more favorably to expansion and contraction. (4) A weldment costs less to make.

Graver's staff of highly skilled welding specialists, and Graver's complete manufacturing facilities insure high quality, economically priced weldments—designed to do their specific jobs properly.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA

NEW YORK • CHICAGO • PHILADELPHIA • WASHINGTON
DETROIT • CINCINNATI • CATASAUQUA, PA.
HOUSTON • SAND SPRINGS, OKLA.

GRAVER

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.75-32.50c; No. 12 foundry alloy (No. 2 grade) 30.75-31.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.75-33.50c; grade 2, 30.00-31.50c; grade 3, 30.00-30.50c; grade 4, 28.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 139.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $215-$220 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 41.03; yellow brass 37.84; commercial bronze, 95%, 40.99; 90%, 40.55; red brass, 85%, 39.59; 80%, 39.15; best quality, 39.15; nickel silver, 18%, 51.91-52.36; phosphor-bronze grade A, 5%, 60.20-62.82.

Rod: Copper, hot-rolled 36.88; cold-drawn 38.13; yellow brass free cutting, 32.23; commercial bronze, 95%, 40.68; 90%, 40.24; red brass 85%, 39.28; 80%, 38.84.

Seamless Tubing: Copper 41.07; yellow brass 40.85; commercial bronze, 90%, 43.21; red brass, 85% 42.50.

Wire: Yellow brass 38.13; commercial bronze, 95%, 41.28; 90%, 40.84; red brass, 85%, 39.88; 80%, 39.44; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip, cold-rolled 60.00c. Rods and shapes, 55.00c Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red Brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 30.00; No. 2 copper 28.00; light copper 27.00; composition red brass 25.50-26.00; radiators 20.50-21.00; heavy yellow brass 20.00-20.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry copper content 20.00.

* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 25.50-26.50; No. 2 24.00-25.00; light copper 22.00-22.50; No. 1 composition red brass 22.00-23.00; No. 1 composition turnings 21.00-22.00; mixed brass turnings 13.00; new brass clippings 20.00-21.00; No. 1 brass rod turnings 19.00; light brass 15.00; clean heavy yellow brass 17.50; new brass rod ends 19.50; auto radiators 17.50-18.00; cocks and faucets, 19.00-19.50; brass pipe 20.00-20.50.

Lead: Heavy 16.50-16.75; battery plates 9.50-10.00; linotype and stereotype 17.00; electrotype 15.75-16.00; mixed babbitt 17.00.

Zinc: Old zinc 12.50-13.00; new die cast scrap 12.50-13.00; old die cast scrap 8.25-8.50.

Tin: No. 1 pewter 80.00-85.00; block tin pipe 110.00-120.00; No. 1 babbitt 70.00-75.00.

Aluminum: Clippings 2S 21.50-22.00; old sheets 17.00-17.50; crankcase 17.00-17.50; borings and turnings 13.00-14.00.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 10-24	24.50	16.80	17.50	139.00	19.00	42.00	50.50	90.16
May 1-9	24.50	16.80	17.50	142.00	19.00	42.00	50.50	90.16
Apr. 17-30	24.50	16.80	17.50	142.00	19.00	42.00	50.50	90.16
Apr. 12-16	24.50	16.80	17.50	147.00	19.00	42.00	50.50	90.16
Apr. 9-11	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Apr. 6-7	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 5	24.50	16.80	17.50	149.875	19.00	42.00	50.50	90.16
Apr. 4	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 3	24.50	16.80	17.50	149.50	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime west, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 119 & 120

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government agencies are slow in making awards, which, in turn, makes it difficult to hold tentative bids for steel.

Wire . . .

Wire Prices, Page 121

Boston — Increase in set-asides on low and high carbon drawn wire to 50 and 60 per cent respectively find many wire mills well below these levels on rated orders. Some backlogs are 15 per cent or less DO volume, and some consumers who will later take large tonnage for defense still are placing pilot orders. Aircraft volume is heavier.

Birmingham—Improvement in wire supply, reported several weeks ago, was temporary. Especially short are most items in agricultural wire along with most wanted sizes in nails.

Warehouse . . .

Warehouse Prices, Page 125

Chicago — Local warehouses estimate about 40 per cent of current business is DO-rated. Inventories reached lowest level in May under impact of extremely heavy demand and reduced receipts from mills. With NPA order M-6 covering carbon steel products becoming effective in June, hope is held that inventory position can be improved. Cold-finished bars are tightest of the carbon products. Plates, structurals, hot-rolled bars and sheets are in scant supply.

Boston—Warehouse stock replacements are slightly improved. Deliveries include considerable overdue tonnage, notably plates and light flat-rolled. Alloy and tool steel procurement is restricted by low base quotas and limited volume available.

New York—Integrated mills are approximating carbon steel basic allocations to warehouses, 85 per cent of base period volume, but tonnage from nonintegrated suppliers is lagging due to inability of latter to get steel for conversion. Replacement of alloys and stainless is more uncertain. One weakness in the 85 per cent carbon steel order for warehouses is that it applies to all products, rather than on basis of availability.

Philadelphia—Warehouses anticipate a fairly good month in June when for the first time they will be guaranteed 85 per cent of the tonnage received from the mills during the base period last year. Some distributors believe May sales will be about on a parity with April, others a shade less. They are apprehensive over the outlook for July in view of the sharp increases in DO mill quotas.

Pittsburgh—Distributors report better receipts but still not sufficient to protect what little inventories are left. Warehousemen expect improvement in June. Complaints are heard considerable tonnage was sold from inventory during the base period and receipts do not show the true volume of warehouse business. Bars, plates and structurals are the shortest warehouse items in this area. Any alloy product is difficult to obtain.

Cleveland — Warehouse sales volume is limited by distributors' low stocks in all product categories. However, receipts from the mills are improving somewhat and expectations are substantial replenishment of inventories will be experienced beginning next month when NPA order M-6, revised, becomes fully effective. This stipulates that the mills ship the warehouses 85 per cent of distributors' tonnage receipts of the carbon products in the base period, first nine months of 1950.

Cincinnati—Warehouse volume will be lower in May than in recent months when inventories, now near depletion, supplemented mill shipments. District needs exceed the greater tonnage anticipated under June allocations.

Birmingham—Warehousemen hope for stock replenishment under revised NPA orders. Shipments are governed only by availability of stocks, which in many instances are not sufficient to supply regular customers.

Seattle—Volume of warehouse steel sales is smaller than a year ago because of low inventories. Demand is rising seasonally. Offers are received here from California at higher than current price levels. Quotations on foreign material are above domestic.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 123

Cleveland—Except for some slackening in automotive demand, volume of industrial fastener orders is running heavy. Increasing tonnage is being diverted to defense and defense-support programs. Producers' steel supply problem on defense account is noticeably improved but shortage of steel for unrated orders continues acute. Currently, bolt, nut and rivet manufacturers are in the process of compiling price data for the Office of Price Stabilization. These data were to have been filed by May 28 under Manufacturers General Ceiling Price Regulation No. 22 but filing time has been extended to July 2.

Tubular Goods . . .

Tubular Goods Prices, Page 123

Seattle—Bids have been opened by Corvallis, Oreg., for 1000 tons of cast iron pipe. Sales agencies are working under a handicap of six months delivery. Western interests can better that shipment despite heavy order backlogs.

Manganese Ore . . .

Washington — Manganese supplies available for consumption held fairly steady in February at 199,256 tons compared with 202,895 in January. Domestic mines shipped 9200 tons of ore averaging 35 per cent or more manganese in February compared with 9000 in January.

Imports increased to 169,165 tons in February from 167,358 tons in January despite a drop in the tonnage from India to 52,000 from 90,000 tons. Principal suppliers were India, Union of South Africa, Gold Coast and Brazil, accounting for about 84 per cent. Imports of ferromanganese equalled 21,200 tons of ore in February against 27,300 in January.

Semifinished Steel . . .

Semifinished Prices, Page 119

Youngstown — Steelmaking operations here are unchanged at 105 per cent of capacity. Three bessemers and 72 open hearths are engaged. Steel plants are having a rough time getting in sufficient scrap to support production schedules.

Pig Iron . . .

Pig Iron Prices, Page 118

Cleveland—Pressure for merchant iron is unabated. Producers are doling out tonnage in such fashion no foundries have been forced to severely curtail operations. Whether impending cutbacks in automobile production will be reflected in a sharp falling off in castings demand remains to be seen. Suppliers to the automotive trade are watching developments closely. Hudson Motor last week cut off car production for a period of two weeks because of excessive dealer stocks. A week or so ago Ford announced it would lay off some 10,000 men between now and midsummer because of lack of steel and other raw materials. Kaiser-Frazer has resumed production after two weeks' suspension of assemblies.

Youngstown—Two district blast furnaces out of a total of 25 are down, one at Republic Steel Corp.'s Youngstown works and one at U. S. Steel Co.'s Ohio works. The latter furnace is expected to resume about June 1 and the Republic stack about mid-June. Other stacks in the area are in bad shape and may be taken off for relining soon.

Philadelphia — Pig iron allocations soon again are predicted by some trade leaders. Supply is worsening steadily. Hardship cases are more numerous. Suspension of operations of the smaller of the two Swedeland, Pa., stacks impends. This furnace, because of ring trouble, is operating now at reduced rate and probably will cease production entirely late in June for possibly five weeks. On the other hand, the Chester, Pa., blast furnace may go into operation by early summer. Most, if not all of the production of this furnace will go to affiliated steel companies, but it will relieve overall pressure for metallics in this area.

Pittsburgh—Pig iron production is high with all district stacks but one in operation. One furnace is tentatively scheduled to be taken off in July for partial relining. Merchant iron supply is tight but foundries are able to get requirements. Inventories are extremely low.

Boston—Allocation of pig iron for third quarter is under consideration. Shortage of basic iron for steelmaking is especially acute. Gray iron and malleable shops manage to maintain operations in most cases, but are unable to build up inventories.

Buffalo—Decided pickup is noted in demand for merchant iron for defense orders. Expansion in prime contracts is reflected in more widespread placement of subcontracts. Despite production cuts, the automotive industry continues a leading buyer.

New York—Outlook is for increasing stringency in pig iron. The smaller of the two stacks at Swedeland,

Pa., is scheduled to go down for repairs late in June. Shrinkage in other producing quarters is indicated, to say nothing of a steady decline in shipments from abroad. Such import iron as is being offered for last half shipment is either too high in price or too uncertain as to delivery.

Cincinnati—Most melters are resigned to established allotments of pig iron. Because most foundries have been using minimum proportion of pig iron in cupolas, even curtailment in end-use programs is not expected to show up in demand for iron.

Chicago—Even with all of this district's 42 blast furnaces operating, production of merchant pig iron falls short of matching needs of foundries. With scrap supply becoming precarious steel companies require more hot metal from their blast furnaces and this diversion of iron is at expense of merchant grades. The situation will be worsened shortly when some large stacks will be idled for repairs. Foreign iron sources appear to be drying up.

St. Louis — Iron makers have opened July books, with the "free" supply being cut back because of a greater tonnage taken by Granite City Steel to meet increased rated steel orders.

Birmingham—Iron users are unable to maintain full schedules due to inadequate pig iron deliveries. Lack is not serious, but a considerably higher rate of casting production could be maintained with ample iron supplies.

Los Angeles — Geneva Steel Co., U. S. Steel subsidiary, will use the 300,000 ton Provo, Utah blast furnace leased from Kaiser Steel to supplement its Geneva pig iron production. Later, the pig iron may be sold to foundries currently without any far western supply source.

Seattle—Pig iron supply prospects are uncertain. Domestic iron is scarce. Foreign prices are so high, about $20 per ton above domestic levels, as to discourage large additional imports. European furnaces are busy on home defense work and are not interested in exporting. Shipping space also is limited and ocean freights high.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 123

Pittsburgh — Coke market is unchanged. Oven foundry grade is in short supply but most steel needs are met. Beehive is moving slowly and little change is expected. Some shipments of Connellsville beehive are going out of this district. Lone idle blast furnace in this area is expected back in blast about the end of this month. Crucible Steel Co. will shut down one of its two stacks at Midland, Pa., July 1 for relining.

Cleveland — Some outside oven foundry coke has been coming into this district of late, and this, along with Connellsville beehive coke, has served to ease supply conditions to some extent. However, pressure for supplies continues as strong as ever. Sellers are apportioning tonnage to customers in such fashion no serious curtailment of foundry activities is reported here. Projected cutbacks in consumer durable goods lines over coming months may result in some further easing of demand for coke.

Youngstown—Local steelmakers think proposed new coal pipelines eventually will ease their disadvantage in steelmaking costs, possibly clipping $10 million to $15 million annually off freight bills. Hanna Coal Co. plans an experimental 3.5 mile line near Cadiz, O., costing $550,000 to build and $200,000 a month to operate. Proponents plan to grind coal fine, mix it about 50-50 with water to form a sludge and then pump it through the pipelines. It is contended a 12-in. line can handle 7000 tons of coal daily at a saving of $1 to $1.50 per ton in freight.

Chicago—Coke is moving to foundries on a regular basis, the situation not being quite as nip-and-tuck as earlier in the year. Less beehive fuel is being shipped in from the East. Some suppliers have been able to catch up with back orders.

Scrap . . .

Scrap Prices, Page 126

Cleveland—Foundries are receiving larger shipments of scrap, but the quality leaves much to be desired. Improvement in supply is costly since bulk of cast grades is coming from distant points, such as Wyoming and Cuba. Cost of cast scrap received by one large foundry here this month averaged $14.02 a ton more in transportation charges than normal.

Supply of steel mill scrap is critical and is expected to become acute later. Scrap generation at some industrial plants is declining. This trend will be accentuated during the vacation period. At the same time, consumption is maintained at record pace. Scrap suppliers and melters are urging all interests to "get the scrap out."

Cincinnati—Scrap iron and steel is moving in greater volume, with some easing in foundry supplies resulting although better grades may not always be available. Mills' inventories are down to a point where allocations are needed.

Chicago — With steelmaking here close to 108 per cent of capacity, mills consume scrap faster than they receive it. Further inventory depletion brings closer the day when more melting material must be allocated to this area or ingot production cut back. Less tonnage is being allocated out of the district than a few weeks back. Mills are scouring the country and are paying substantial spring-boards for material which makes specifications.

Boston—Allocation of heavy melting steel scrap aids in maintaining steel operations. Upgrading continues. In Providence, R. I., No. 1 heavy melting is moving at a water rate of $37.25 while the same grade in the Boston area is moving around $36.75 based on a $3.50 barge rate to Sparrows Point, plus dock charges. Cast scrap is moving in better volume.

Philadelphia—There has been some easing in cast scrap supply but the situation in the steel grades is more acute. Steel mill inventories continue to slip, but steel production is sustained for the present. The time is approaching, trade leaders think, when the industry will be forced to curtail. Producers are trying to hold out until the summer vacation period.

Buffalo—Although local scrap col-

lections remain low mills' hopes have been bolstered by an influx of water receipts, both from the east via the canal and from upper lake points. A fleet of five barges and one lake boat arrived at the start of the week, while three more fleets were reported en route.

Pittsburgh—OPS investigators are active in this area seeking to uncover evidence of upgrading. Inventories here are low. Mills and foundries are using as much pig iron and hot metal as possible but some foundries have reduced operations slightly because of scrap scarcity. Collections have not been too good.

St. Louis—Scrap stocks continue to shrink. Most large consumers now ask for dealer allocations. Country shipments are spotty.

Birmingham—There isn't enough scrap around and some users have obtained allocations.

Seattle—Scrap collection drive is being organized here. Receipts increased substantially of late but mills are unable to add materially to stockpiles. Foundry inventories of cast scrap are low.

Iron Ore . . .

Iron Ore Prices, Page 125

Cleveland — Consumption of Lake Superior iron ore is heavy with 176 furnaces in the United States and 9 in Canada in blast. Consumption was 7,235,243 tons in April compared with 7,371,888 in March, making total for first four months of this year 28,368,680 against 25,208,747 for the like 1950 period. Stocks dropped to 15,071,767 tons on May 1 from 17,335,362 a month earlier. A year ago they amounted to 14,099,250.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7300 tons, addition to East River generating station, Consolidated Edison Co., New York, to American Bridge Co., Pittsburgh.

900 tons, plant addition, Hunter-Douglas Inc., New Hyde Park, L. I., to Bethlehem Steel Co.

650 tons, manufacturing building, Lewyt Corp., Mineola, L. I., through Brown & Matthews, New York, to Bethlehem Contracting Co., Bethlehem, Pa.

360 tons, motor truck equalizers, American Locomotive Co., Schenectady, N. Y., to Bethlehem Steel Co.

250 tons, transmission towers, Bonneville Power Administration, Portland, to Creamer & Dunlap, Tulsa, Okla., low $64,674.

STRUCTURAL STEEL PENDING

24,000 tons, transmission towers, Bureau of Reclamation, Washington, for 1952 delivery; bids asked.

1070 tons, state bridge, Union county, New Jersey; Poirier & McLane, New York, low on general contract.

450 tons, catapult foundation, Navy yard, Philadelphia; bids closed May 24.

400 tons, state bridge work, Ontario and Monroe counties, New York; Lane Construction Co., New York, low on general contract.

300 tons general repair shop, Anchorage, Alaska, for Alaska Railroad; joint low bid $844,332 by J. C. Boespflug Construction Co. and Kiewit Sons Co., Seattle, rejected; new bids, revised specifications, opened May 22.

115 tons, J. P. Alvey substation, Eugene, Oreg.; bids to Bonneville Power Arministration, June 1.

100 tons, shapes and other miscellaneous steel requirements, state bridge work, Westmoreland county, Pennsylvania, bids June 8.

Unstated, hangar, Eielson air field, Alaska; Peter Kiewit Sons Co., Seattle, low $3,671,313.

Unstated, fabriacted substation steel, Fort

Peck project; bids to Bureau of Reclamation, Denver May 22.

Unstated, field maintenance and artillery shops, Fort Richardson, Ladd and Eielson fields, Alaska; Boespflug & S. Birch Sons, low $3,167,262; Kuney-Johnson Co., low $569,000; Peter Kiewit Sons Co. low on two jobs, $349,232 and $465,453, respectively.

Unstated, taintor gates, machinery, stop logs, Chief Joseph dam; bids to U. S. Engineer, Seattle, June 12.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, Army building, Fort Richardson, Alaska, to Soule Steel Co., Portland, Oreg.; Morrison-Knudsen Co., Seattle, general contractor.

150 tons, indoor facilities building, Ladd Field, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Kuney-Johnson Co., Seattle, general contractor.

REINFORCING BARS PENDING

350 tons, deck and electrical work, Charles river bridge-North station connection, Central Artery, Boston; V. Barletta Co., Boston, low, $468,825.

255 tons, substructure, Charles River bridge-North station connection, Central Artery, Boston; C. J. Maney Inc., Boston, low, $1,118,065.

218 tons, state bridge work; 148 tons, Butler county and 70 tons, Westmoreland county, Pennsylvania, bids June 8.

105 tons, bars and mesh, highway and bridge, Warwick, R. I.; bids in.

Unstated, Langendorf Bakery Co. plant, Seattle; E. E. Sedille, Seattle, low, $438,000.

Unstated, seven barracks, Fairchild air field, Spokane, Wash.; Carbon Bros. & Plath, Seattle, low to U. S. Engineer, $1,061,022.

PLATES . . .

PLATES PLACED

1400 tons, 6824 feet 78-inch water pipe, for Tacoma, Wash., to American Pipe & Construction Co., Portland, Oreg., low $322,328.

1000 tons, miscellaneous tanks, Shell Oil Co., Texas, to unknown fabricator.

245 tons, tank, Long Island Lighting Co., Glenwood Landing, L. I., to Chicago Bridge & Iron Works, Chicago.

100 tons or more, additional, contract 17, underground steel tanks, naval air stations, east coast, to Hammond Iron Works, Warren, Pa., $647,275.

100 tons or more, 19 underground steel tanks, naval air stations, west coast, to American Pipe & Steel Corp., Alhambra, Calif., $648,176.05.

PLATES PENDING

3000 tons, ten storage tanks for Navy base, Mukilteo, Wash.; Chicago Bridge & Iron Co., Seattle, low $738,610.

PIPE . . .

STEEL PIPE PLACED

635 tons, 24-inch gas pipe, Pittsburgh area, for Columbia Gas Systems Inc., Youngstown Sheet & Tube Co., Youngstown, O.

STEEL PIPE PENDING

Unstated, 6960 feet 4-inch, or alternatives; bids to H. O. Hutt, sec'y., Alderwood Manor, Wash., May 28.

CAST IRON PIPE PENDING

1000 tons, Corvallis, Oreg., system improvement; bids in May 21.

RAILS, CARS . . .

RAILROAD CARS PENDING

Great Northern, 1000 box, 700 ore, 300 ballast hopper, and 50 express refrigerator cars and 15 cabooses; purchase authorized by directors.

Norfolk & Western, 100 seventy-ton covered hopper cars; pending.

U. S. Army Transportation Corps, Marietta, Pa., 1000 flat cars, bids May 29; list comprises 650 one hundred-ton flat cars for freight service, 150 eighty-ton flat cars for high-speed freight service, 100 eighty-ton flat cars for passenger service and 100 one hundred-ton flat cars for passenger service.

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Harbison-Walker Enlarges

Harbison-Walker Refractories Co., Pittsburgh, will build a $3.5 million silica plant at Downington, near Philadelphia. This plant will be in addition to the scheduled $22 million expansion program previously announced. It will be a duplicate of the Windham, O., plant the company will complete about the end of this year. The Downington plant will be used to produce materials for lining industrial furnaces used in coke production.

Harbison-Walker's new clay brick unit at Bessemer, Ala., will be in operation by July, permitting capacity at that plant to be doubled. A new tunnel kiln in operation has increased production at the Fulton, Mo., Works by 25 per cent.

Potential capacity of the company's magnesite plant at Cape May, N. J., is expected to be doubled by July, as will production at Fairfield, Ala., by end of 1951.

Detecto Buys Scale Business

Industrial scale business of Yale & Towne Mfg. Co., New York, was sold to Detecto Scale Inc., Brooklyn, N. Y., effective June 1. The transaction involves scale patents, equipment, parts and inventory, but none of the Yale trademarks, except Kron.

Daystrom Building Plant

Daystrom Corp., Olean, N. Y., is leasing space in the Scranton, Pa., shops of the Lackawanna railroad where it will store equipment until its $4 million plant in Eynon, Pa., is ready. The company makes laminated plastic panels and metal furniture.

Plibrico Appoints Agent

Plibrico Jointless Firebrick Co., Chicago, appointed Gulf States Insulation Co., Mobile, Ala., as distributor in that territory.

Ohio Seamless Lets Contract

Contracts were awarded by Ohio Seamless Tube Co., Shelby, O., for a seamless tube mill, a 48-foot diameter rotary furnace for heating billets, a building to house the furnace, and a large electric motor for driving the mill. The company ordered for the present seamless tube mill a modern heavy-duty billet piercer and motor, together with some other auxiliary equipment. This is part of a $2.5 million plant improvement program. Part of the new equipment is scheduled to be ready for use by Jan. 1; the entire program is expected to be completed by next May.

Link-Belt Co. Building Plant

Link-Belt Co., Chicago, is constructing an engineering and manufacturing plant for the production of elevating, conveying and processing machinery in Colmar, Pa. The company also is planning an expansion at either its San Francisco or Los Angeles plant.

Rotary Pump Maker Expands

Snyder Co., Baltimore, is rearranging its plant and installing some new equipment. The company designs and assembles rotary pumps used in the fueling of diesel engines.

Appoints New England Agent

Niagara Machine & Tool Works, Buffalo, appointed Austin-Hastings Co., Cambridge, Mass., as its sales representative in all New England, except Connecticut. Niagara Machine makes presses, shears, machines and tools for plate sheet metal work.

Dow Furnace Co. Moves

Dow Furnace Co. is occupying its new factory and office building at 12045 Woodbine Ave., Detroit. The plant will increase the company's manufacturing, research and development facilities and is also headquarters for the engineering and regional sales departments.

Martin Employs Third Shift

Glenn L. Martin Co., Middle River, Md., increased operations to a three-shift basis. The plant now employs approximately 15,000, and several thousand more are to be hired in the next few months. The airplane company now has unfilled orders of around $300 million. It also has a pending order for manufacture of the British-designed Canberra light bomber.

Armaments Firm Expanding

Aircraft Armaments Inc.'s plant at 4415-4417 Reisterstown Rd., Baltimore, is getting into full production and will have a new second story addition that will contain about 7000 square feet. The company occupied its plant early this year and has assembled a force of about 50 primarily for re-

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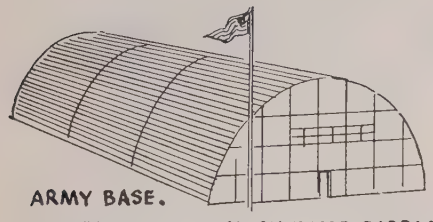
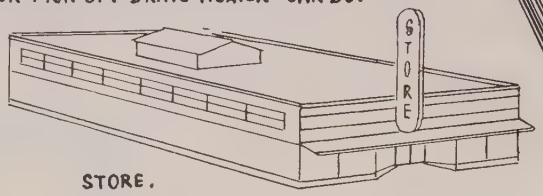
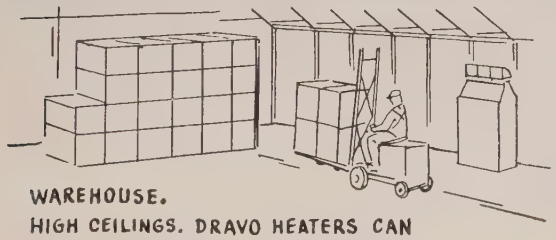


ARMY BASE.
WINTER CONSTRUCTION ON THESE BARRACKS. CAN INSTALL DRAVO HEATERS EARLY FOR HEAT DURING CONSTRUCTION AND AFTER COMPLETION.

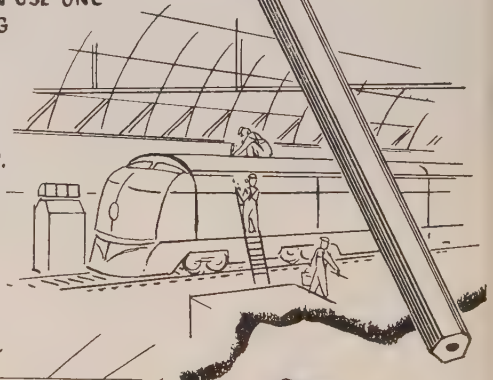


STORE.
WITH DRAVO HEATERS, CAN USE ONE SET OF DUCTS FOR HEATING AND AIR-CONDITIONING.

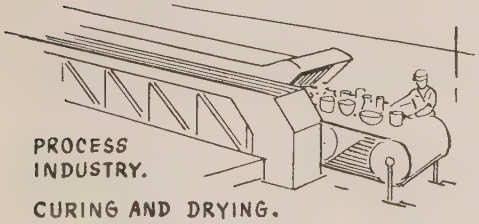
INDUSTRIAL PLANT.
DRAVO HEATERS HAVE 150' AIR THROW. NO DUCTS NEEDED.



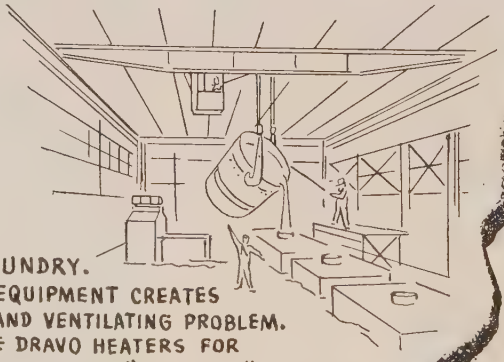
WAREHOUSE.
HIGH CEILINGS. DRAVO HEATERS CAN REDUCE ROOF HEAT LOSS, KEEP HEAT WHERE IT'S NEEDED.



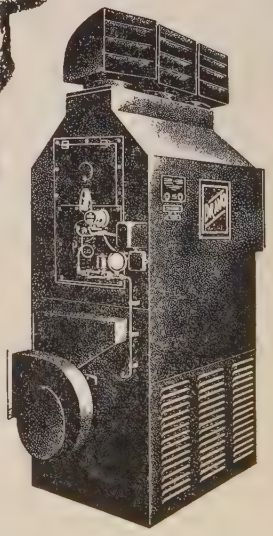
DIESEL RAILROAD SHOP.
NEEDS HEAT AT WORKING LEVEL. DRAVO HEATERS IDEAL.



PROCESS INDUSTRY.
CURING AND DRYING. SPECIFY DRAVO HERE.



FOUNDRY.
EXHAUST EQUIPMENT CREATES HEATING AND VENTILATING PROBLEM. USE DRAVO HEATERS FOR TEMPERED "MAKE-UP" AIR.



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search and development of weapons. It is manufacturing fire control equipment for tanks and electronics equipment. Harry T. Roland is president and Joel M. Jacobson, vice president and general manager.

Morrison Expanding Plant

Morrison Steel Products Inc., Buffalo, will spend $1,720,000 to expand its plant for defense production, increasing capacity about 50 per cent. A plant addition will contain 100,000 square feet. The firm will produce about 63 different parts for military vehicles. The company is a pioneer in the steel stamping industry.

Donath Machine Co. Formed

Donath Machine Co. was incorporated in Buffalo with stock of 200 shares. Incorporators are Harry Bisgeier, Morris Reich and Ralph Saft.

Buffalo Foundry To Expand

Pratt & Letchworth Co., will enlarge its foundry at 189 Tonawanda St., Buffalo, at a cost of $35,000.

Linde Boosts Operations

Linde Air Products Co., New York, is completing a $100,000 expansion project at its Tonawanda, N. Y., plant. This will enable that plant to double production. A former storage building has been converted for manufacturing purposes. The plant will go from a 40 to a 48-hour week on June 1.

Plans Expansion in Canada

Canadian Industries Ltd., Montreal, Que., will erect a plant at Copper Cliff, Ont., to produce liquid sulphur dioxide from by-product gases arising from the operation of the oxygen flash smelting process recently developed by the International Nickel Co.

Ready Tool Exporter Named

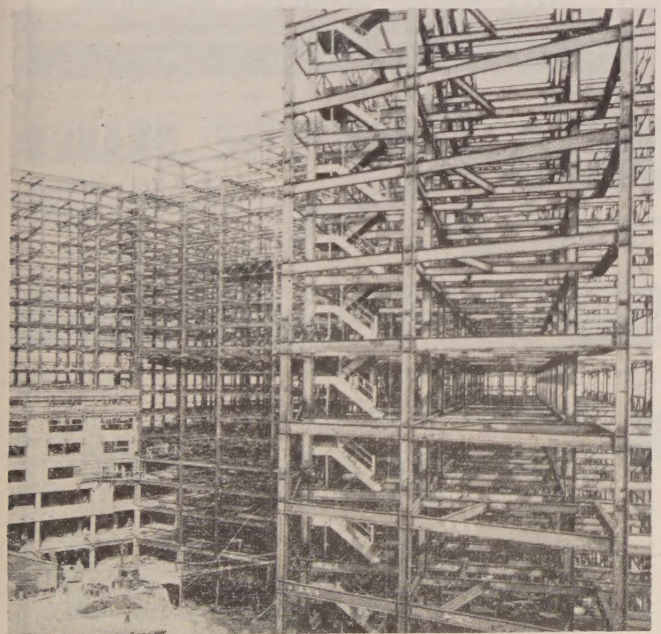
Ready Tool Co., Bridgeport, Conn., appointed Kern & Collins Inc., New York, as its export manager, charged with worldwide distribution of the company's line of antifriction centers, cemented carbide tipped centers, high-speed centers, tool holders, grinder machine dogs and other allied tools.

Seeks Plant Improvements

Crown-Zellerbach Corp., San Francisco, applied for a $22.3 million certificate of necessity for proposed improvements at its Camas, Wash., and West Linn, Oreg., paper mills.

Libbey-Owens To Build Plant

Certificate of necessity has been issued to Libbey-Owens-Ford Glass Co., Toledo, O., for construction and equipment of a $14,183,000 plant which will be in the form of an addition to the company's plant at Rossford, O. No contracts have been negotiated yet for



START OF A STATLER: Erection of steel for the $20 million Statler hotel and office building in Los Angeles has been completed by Consolidated Western Steel Corp. The skeleton mass of metal represents over 7200 tons of steel, mainly large girders, held together by over 200,000 rivets. Besides handling the erection, the U. S. Steel subsidiary also fabricated the steel at its Maywood, Calif., plant

the purchase of manufacturing machinery nor have any contracts been let for building construction. The plant will be engaged in production of precision plate glass, primarily in defense work.

Coast To Get Fastener Plant

Cherry Rivet Co., Los Angeles, a division of Townsend Co., New Brighton, Pa., will build a plant fifteen miles east of downtown Los Angeles. Completion of construction is expected about Nov. 1. Initially the plant will be utilized for production of Cherry line of mechanical blind fasteners. Should the present defense emergency subside, Townsend plans to shift the production of a substantial volume of its standard products to this plant, such as solid rivets, tubular rivets, nails and other cold-headed items.

Atlas Mineral To Expand

Atlas Mineral Products Co., Mertztown, Pa., plans further expansion of its Houston plant. New construction will include a modern lining shop and storage faciliites.

Will Produce New Type Wire

A $2 million expansion is being considered for the Dunkirk, N. Y., plant of Allegheny Ludlum Steel Corp., Pittsburgh. The company is preparing for a large government order calling for production of a new type stainless steel wire for the Army Signal Corps.

Castings Firm Adds to Plant

Arlington Bronze & Aluminum Corp., Baltimore, nonferrous castings, is adding 4800 square feet of production space. Joseph O. Danko is president.

Premium Smelting & Refining

Premium Smelting & Refining Co. has been established at 742 Hertel Ave., Buffalo, according to papers filed in the county clerk's office.

Plans Steel Casting Plant

Hartford Electric Steel Corp., Hartford, Conn., plans an increase in capacity by constructing a steel casting plant to cost $1 million. Completion is planned for late fall.

Colonial Metalcrafters

Colonial Metalcrafters, 828 Frederick Ave., Catonsville, Md., ornamental iron worker, has moved into much larger space at 2 Winter Ave.

Conduit Maker Names Agent

Enameled Metals Co., Pittsburgh, appointed Fred H. Simmer Co., Dallas, as its sales representative in Texas, Oklahoma and Arkansas. The company produces electrical metallic tubing, conduit and fittings.

Vulcan Consolidates Offices

Vulcan Stamping & Mfg. Co. and Vulcan Tin Can Co. consolidated their offices and manufacturing operations in larger buildings on La Grange road, P.O. Box 367, Bellwood, Chicago.

Machine Shop Installed

Oxford Co. Inc., 2504 Harford Rd., Oxford, Pa., an assembler of aluminum products, has just completed installation of a machine shop.

Installs New Rolling Mill

Metals & Controls Corp., General Plate Div., Attleboro, Mass., installed a newly designed precision rolling mill. Affiliated with Spencer Thermostat Corp., it produces temperature control devices.

Plans Air Filter Production

Carrier Corp., Syracuse, N. Y., and Arthur D. Little Corp., Cambridge, Mass., have organized Cambridge Corp. for the manufacture of an air filter to exclude radioactive particles from the atmosphere.

LeTourneau Plans Plate Mill

R. G. LeTourneau Inc., Peoria, Ill., plans immediate construction of a steel mill at Longview, Tex., capable of producing 1000 tons of finished steel plate a day. Rollers in the mill will measure 58 inches in diameter and 156 inches long, capable of rolling a 12-foot wide standard plate. Employing a new driving principle, an 8000-hp unit will be used. The company's principal product is earth-moving machinery.

G. E. May Lease Facilities

An option to lease manufacturing space in Ludlow, Vt., is held by General Electric Co., Schenectady, N. Y., as part of its expanded jet-engine production program. These facilities would be used for "parts manufacturing operations, including die-sinking." Headquarters for G.E.'s Aircraft Gas Turbine Divisions ultimately will be at its Lockland, O., plant where a vast aircraft jet engine and turboprop test, development and production center is being established. These divisions also operate large facilities at the Lynn, Mass., River Works, where a manufacturing plant and aircraft gas turbine laboratory are located; and at Everett, Mass., where jet engine components are produced.

MATERIALS--USED EQUIPMENT

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Cabooses, Eight Wheel, Cupola Type
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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
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EXTRA LONG FLAT CARS

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Side Dump, 16-Yd., 40-Ton, Lift Door
Side Dump, 20-Yd., 40-Ton, Lift Door

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Gasoline—10-Ton to 25-Ton
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1—WARNER-SWASEY #3A TURRET LATHE 4½" Cap.
1—NILES 42" VERT. BORING MILL
1—HENDEY YOKE HEAD LATHE 16 x 156" Q.C.
1—P&W 20 x 48" Grd. Hd. LATHE Mod. "B"
1—3/16" x 4′ POWER SHEAR
1—ROOT 16 SPINDLE HYDR. DRILL PRESS
1—Bliss 73¾C Gap Fr. Press 75 ton
1—4B BLISS Double Crank Press
1—#4½ 56 Ton Cap. BLISS PRESS 4½" Str. Dbl. Rl. Fd. Scr. Ctr. 1942
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